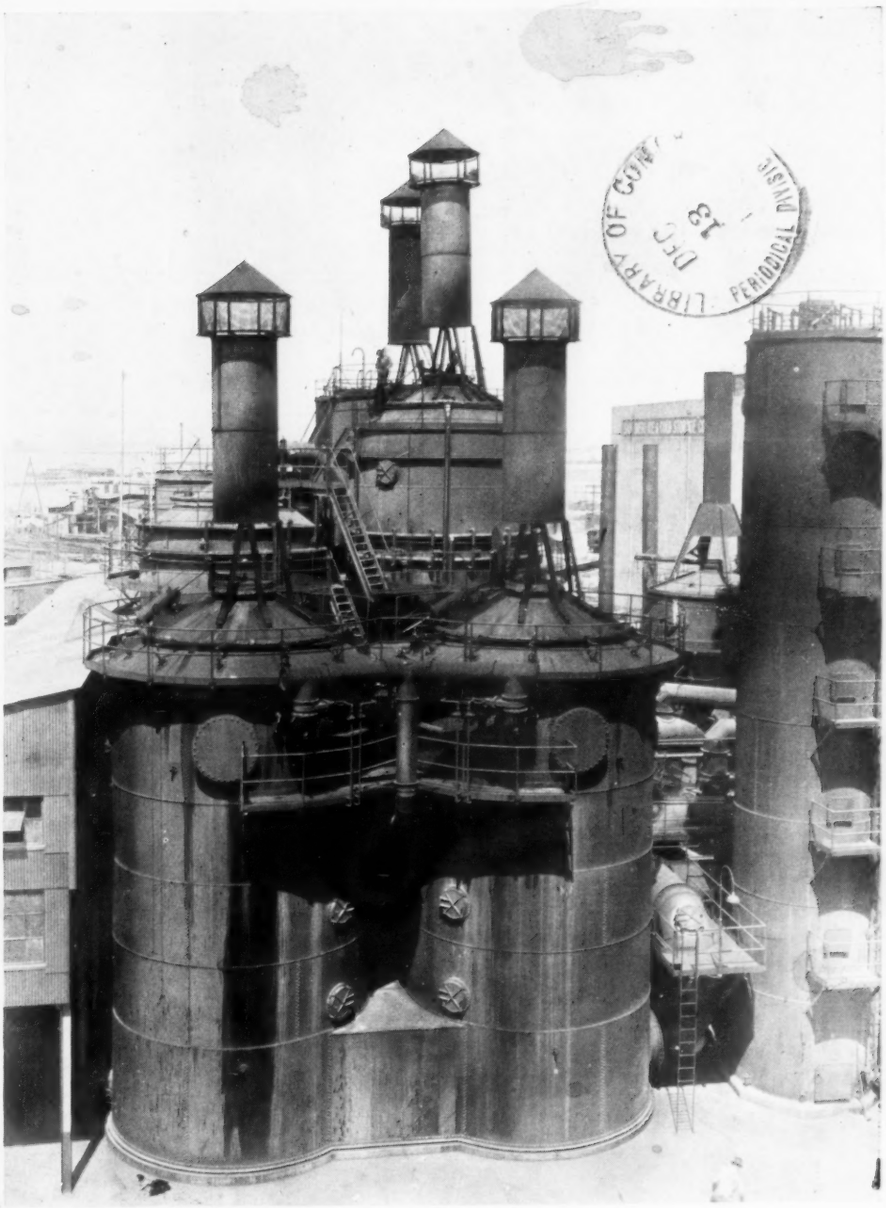
WESTERN GAS

December
1928

20 Cents
the Copy



Gas generator installation of the San Diego Consolidated Gas and Electric Company, San Diego, California.

LIBRARY OF CONG... PERIODICAL DIVISION
DEC 13

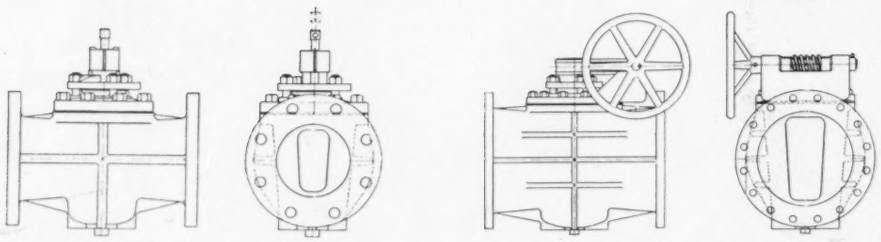
A MONTHLY JOURNAL DEVOTED TO THE WESTERN GAS & APPLIANCE INDUSTRIES

PRINT IN BINDING

Nordstrom *Venturi* Valves

for gas distribution

In high pressure gas distribution where the total pressure drop incurred through the use of valves in a line is a very small percentage of the total line pressure loss, Nordstrom Venturi Valves particularly fill the application. On natural gas lines where the conditions include high velocities, high pressures and considerable foreign matter, this type, with its smooth internal contours, is well adapted. All the advantages of a plug cock are combined with compactness, tightness against leakage, ease of turning, and longest life.



Nordstrom Venturi Valve — worm gear operated—10 to 24-inch

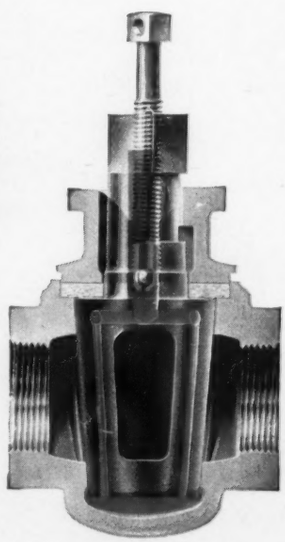
Nordstrom Venturi Valve—wrench operated—6 to 12-inch

These Valves are manufactured regularly for pressures up to 150 pounds per square inch and may be had on special order for 250 and 500 pounds. Furnished for wrench operation, or with concentric spur gear or worm gear mechanism. Made of semi-steel which has a tensile strength of 30,000 pounds per square inch.

Our new Catalog No. 6 devotes several pages to specifications and service of the Venturi Type. Ask for a copy.

MERCO

Reg. U. S. Pat. Off.



Illustrating the lubrication principle in Nordstrom Valves. The lubricant screw, when turned, exerts pressure, forcing lubricant down, around and under plug.

Merco Nordstrom Valve Co.

Subsidiary of The Merrill Company

Engineers . . . Manufacturers

NEW YORK CITY—11 W. 42nd St.
BOSTON—184 Boylston St.
BUFFALO—Genesee Bldg.
CLEVELAND—Engineers Bldg.
CHICAGO—176 W. Adams St.
NEW ORLEANS—Masonic Temple Bldg.
HOUSTON—Petroleum Bldg.
DALLAS—Magnolia Bldg.
LOS ANGELES—Union Bank Bldg.
SAN FRANCISCO—343 Sansome St.
SEATTLE—Colman Bldg.
AGENCIES—In Principal Cities.

Canadian Manufacturers—PEACOCK BROS., LTD.—Montreal, Que., Cobalt, Ont., Winnipeg, Man., Vancouver, B. C.

FACTORIES: Oakland, Calif., and Belleville, N. J.

The illustration shows Getty Gasoline Company's new gasoline plant, containing four Cooper Type-80 single gas engines in the Long Beach, California, field.

A Cooper Engine

is a better engine because its materials are better.

The same study and application of special materials which make the automobile you drive today twenty to thirty per cent lighter than a 1915 model make a Cooper gas engine better. Size of parts are no longer a fair comparison. No engine part should be heavier than necessary to safely do its work because weight alone increases reciprocating forces and hastens wear.

Investigate the alloy steels, stampings, and number of drop forgings used in Cooper engines and you will consider no other.

THE C. & G. COOPER CO.

Mt. Vernon, Ohio

Dallas Los Angeles Tulsa

December, 1928, Volume IV, Number 12. WESTERN GAS is published by Western Business Papers, Inc., at 124 West Fourth Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 3 years $5.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, California, under the Act of March 3, 1879.

LONG float travel

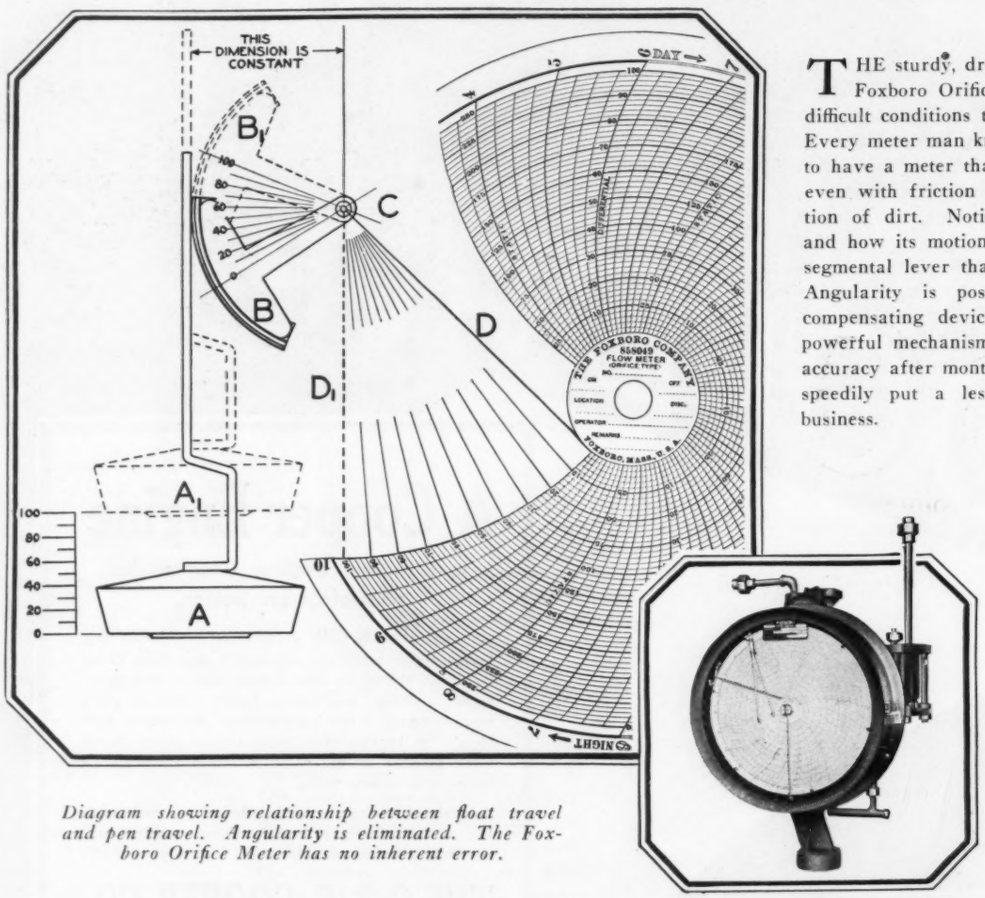


Diagram showing relationship between float travel and pen travel. Angularity is eliminated. The Foxboro Orifice Meter has no inherent error.

THE sturdy, drop forged steel float of a Foxboro Orifice Meter is built for the difficult conditions that exist in the oil field. Every meter man knows how important it is to have a meter that can be depended upon even with friction caused by an accumulation of dirt. Notice the long float travel and how its motion is communicated to the segmental lever that operates the pen arm. Angularity is positively eliminated. No compensating devices are necessary. This powerful mechanism operates with amazing accuracy after months of neglect that would speedily put a less rugged meter out of business.

LONG float travel is but one of the many advantages of Foxboro Orifice Meters that have led to their enthusiastic adoption by engineers in oil and gas fields and refineries everywhere. They are easy to clean, quick to assemble, easy to zero, low in maintenance cost and with no inherent error. Pen travel and scale chart are uniform. They are the ideal meter both for the man in the field and the man in the office. Made in three standard differential ranges—20, 50 and 100 inches of water.

THE FOXBORO COMPANY

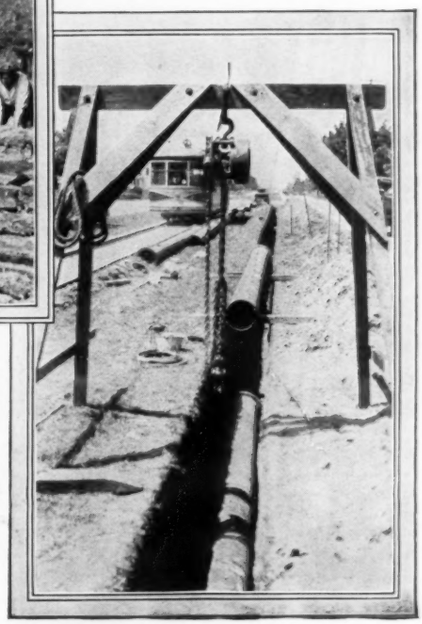
Neponset Avenue, Foxboro, Mass., U.S.A.
205 So. Cheyenne Avenue, Tulsa, Okla.
Magnolia Bldg., Dallas, Texas
J. E. Treacy, Strada Golesti No. 9, Ploesti, Roumania

New York · Chicago · Boston · Atlanta
Philadelphia · Cleveland · Pittsburgh · Los Angeles · Detroit · Portland, Ore. · Rochester, N. Y. · San Francisco

FOXBORO
REG. U. S. PAT. OFF.
THE COMPASS OF INDUSTRY

Instruments for Controlling, Recording and Indicating Temperature, Flow, Humidity and Pressure

New method reduces pipe laying costs



–Pontiac success widely observed

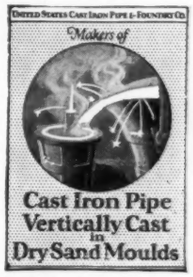
ENGINEERS and officials of leading mid-western gas companies gathered at Pontiac, Michigan, recently to inspect the laying of a new type main.

Two thousand feet of 12″ multiple length*deLavaud cast iron pipe with Anthony joints was laid in record time despite unusual difficulties in grade crossings and at street intersections.

So much interest was shown in the success and economy of this latest type of cast iron pipe for high-pressure gas and water lines that a brief engineer's report of the work has been prepared. A limited number of copies of this report is available to anyone interested in this most recent development in underground pipe lines.

Photographs and data by courtesy of Consumers Power Co.

Upper left picture shows the simplicity of connecting the Anthony Joint. No special tools or skill required. Center photograph illustrates the ease of handling 24 ft. lengths of deLavaud pipe. Right hand illustration shows the chain hoist used to lower pipe into trench.



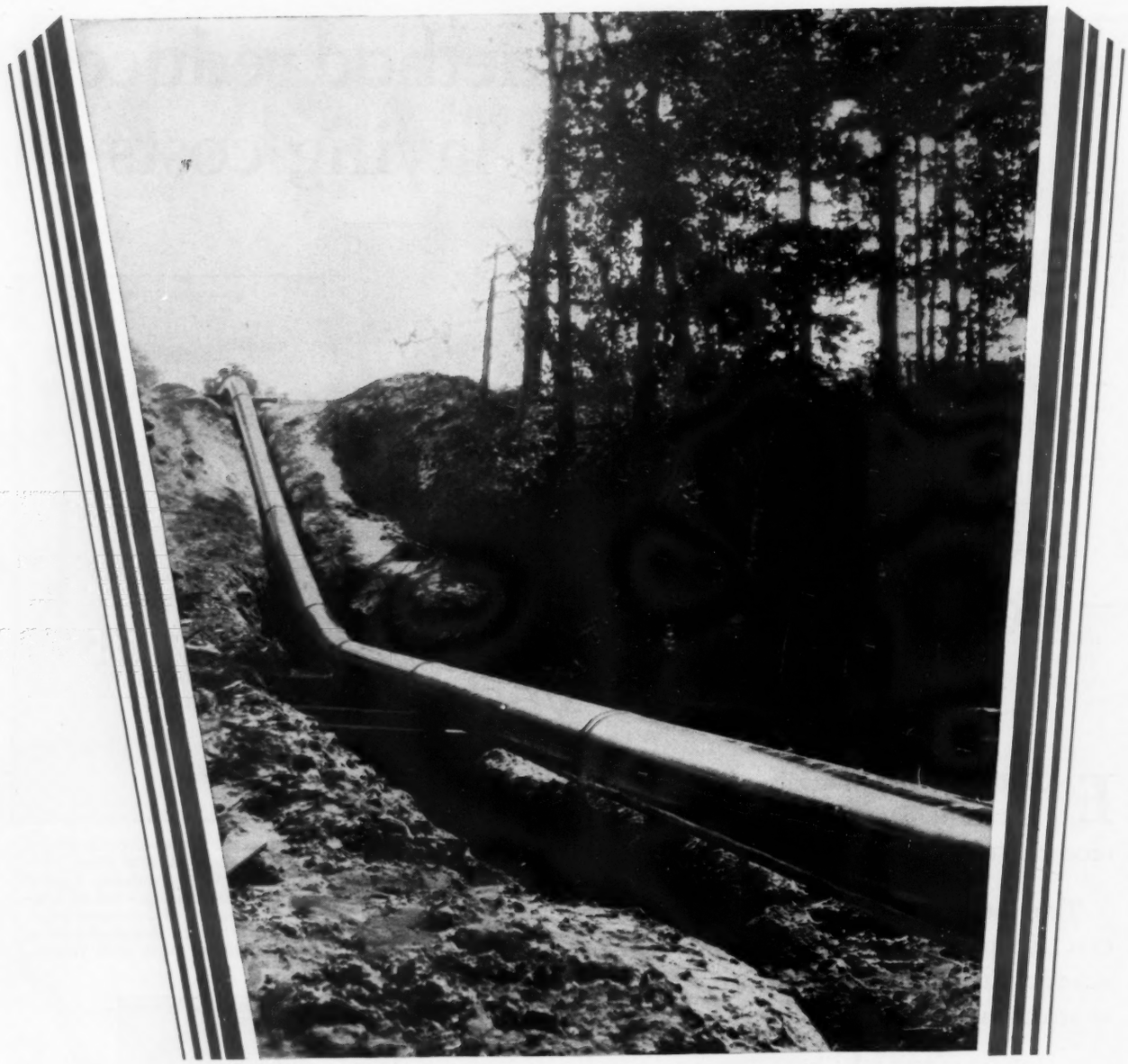
*Note: Multiple length deLavaud pipe comes in 24 ft. lengths consisting of two standard 12 ft. lengths bronze welded at the plant under ideal conditions, and shop-tested.

United States Cast Iron Pipe and Foundry Company

General Offices:
Burlington, New Jersey

Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
Buffalo: 957 East Ferry Street
Cleveland: 1150 East 26th Street
New York: 71 Broadway

San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.
Minneapolis: 6th Street & Hennepin Avenue

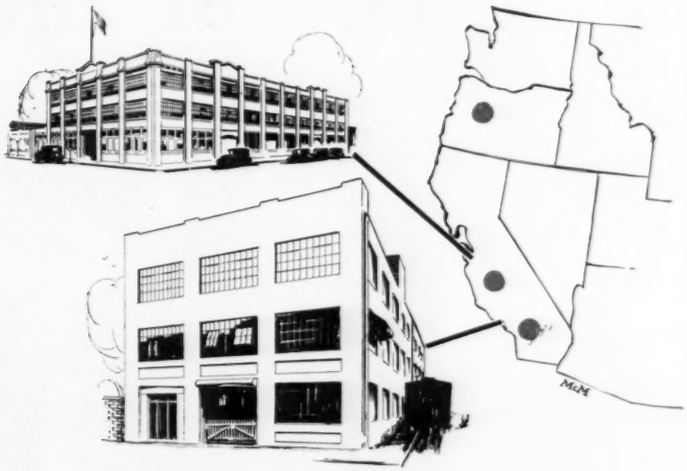


Somebody Said It Wouldn't Weld

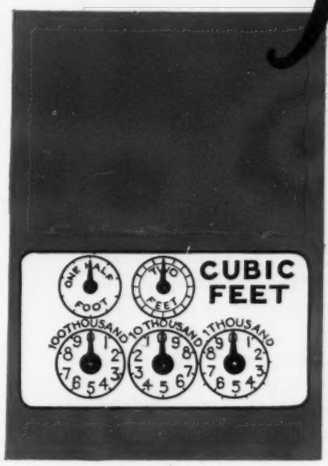
This picture shows part of a 20 inch line, 160 Miles Long, all *SmithWelded* Gas Line Pipe, all joints welded.

A. O. SMITH CORPORATION
Oil & Gas Field Products Division
General Offices: Milwaukee, Wisconsin
District Offices at New York, Pittsburgh, Tulsa, Houston, Los Angeles

SMITH*WELDED*
GAS LINE PIPE



PACIFIC METER WORKS · PIONEERS IN THE WEST ·



Performance in Service Confirms Their Value

MECHANICAL ASSETS OF PACIFIC METERS ARE INSURED BY WIDE FACILITIES—EXPERIENCED LABOR—AND THOROUGH INSPECTION IN EVERY STAGE OF MANUFACTURE

1—Adjustable Tangents.

2—Double Acting Clicks.

3—Channels and Valve Construction.

4—Clearance Between Diaphragms and Casing.

5—Bottom—Solid—Leak Proof.

6—Top Cover and Flange Construction.

7—Bridge Plate and Carriage Design and Construction.

8—Durability of Valve Seat and Valve Cover.

9—Diaphragms—exclusive American Meter Company quality, fabrication methods and impregnation formulas.

10—Casing constructed of finest quality Tinned Steel manufactured to specification.

These and other features of Pacific Meters conform to a definite manufacturing policy of specialization in Pacific Coast requirements

Known Factors in Accurate and Productive Meter Service

PACIFIC METER WORKS

Specializing in the Manufacture of Gas Meters and Allied Apparatus for Pacific Coast Requirements

San Francisco **Established 1901** **Los Angeles**

Northwestern Representatives **Portland** Northwest Gas and Electric Equipment Company

AMERICAN METER CO · MEASUREMENT ENGINEERS · CUBIC FEET

Two of the Latest

The **MEMPHIS Gas Line**

The **ATLANTIC Oil Line**

Among the Greatest Gas and Oil Lines

FOR approximately 160 of its 220-mile length the great 18″ Memphis Natural Gas Line will run through the low flood regions of the Mississippi River. This section of the line requires the utmost in protection and the Memphis Natural Gas Company has, consequently, selected BITUMASTIC ENAMEL for this all-important work. Transmission and the distribution of gas from the Monroe fields in Louisiana to Memphis and the intervening region is thus assured for many years to come. For nearly half a century, in fact, no pipe nor any other metal surface to which BITUMASTIC ENAMEL has been properly applied has ever suffered from the inroads of corrosion.

ANOTHER notable BITUMASTIC job is now under way—the Atlantic Line—one of the largest oil lines in the world. BITUMASTIC ENAMEL is being applied to all 500 miles of this line—a 10″ pipe laid by the Atlantic Pipe Line Company (a subsidiary of the Atlantic Refining Company) between Midland, Texas, and the Company's refinery in Port Arthur. These jobs are the latest undertaken for the greatest pipe line projects in the world. They are but two of many such while an even larger number of applications have been made to smaller distribution systems in all sections of the country. Engineers in every field have found no coating to compare with BITUMASTIC for the permanent protection of steel pipe.

Why should any oil or gas line company or a distributor of manufactured gas suffer losses from corrosion or experiment with untried coatings when this—

"Proven Protection Against Soil Corrosion"

—is available to all? Write for our book—"The Protection of Pipe Lines." Also Bulletin 205—"Directions for Application."

BITUMASTIC

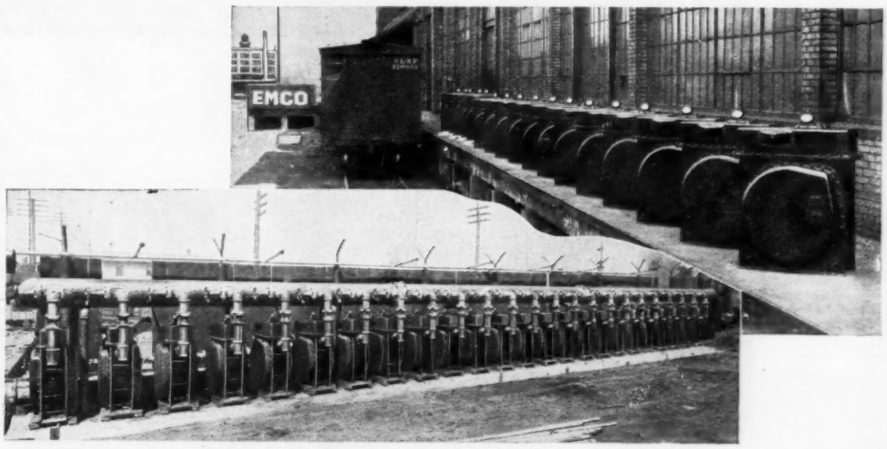
REG. U.S. PAT. OFF

ENAMEL

Wailes Dove-Hermiston Corporation

17 Battery Place, New York

Philadelphia Cleveland Chicago Houston Tulsa San Francisco



250,000 cu. ft. per hour measured with these EMCO No. 5 Meters

THE EMCO No. 5 Pressed Steel Type Dry Gas Meter has rapidly gained the faith of gas companies. This meter will measure with extreme accuracy any volume up to 10,000 cu. ft. per hour.

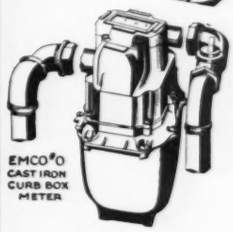
In addition to the large capacity acquired in this meter, there has also been a marked reduction in space needed for installation.

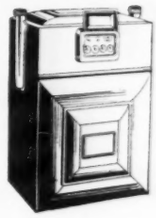
Industrial consumers appreciate a positive direct reading meter, occupying but a small amount of floor space, and not susceptible to damage.

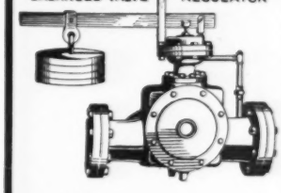
The above installation shows 24 EMCO No. 5 Pressed Steel Meters used at a steel plant in the Middle West

EMCO #0 CAST IRON DRY GAS METER

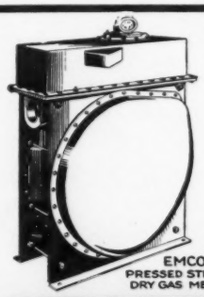
IRONCLAD CAST IRON DRY GAS METER

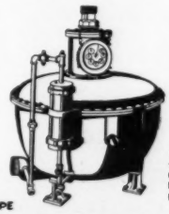

EMCO #0 CAST IRON CURB BOX METER

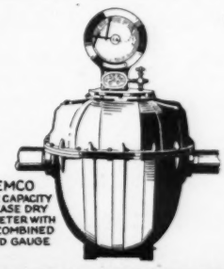

EMCO TIN METER


EMCO HIGH PRESSURE BALANCED VALVE REGULATOR

EMCO WATER HEATER AND GAS APPLIANCE REGULATOR

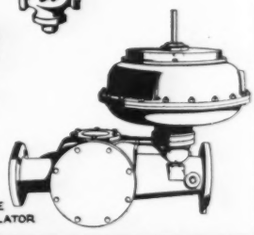

EMCO #5 PRESSED STEEL TYPE DRY GAS METER


WESTINGHOUSE FLUID POSITIVE GAS METER


EMCO LARGE CAPACITY CAST CASE DRY GAS METER WITH EMCO COMBINED RECORD GAUGE

EMCO ORIFICE GAS METER

EMCO DOMESTIC SERVICE REGULATOR

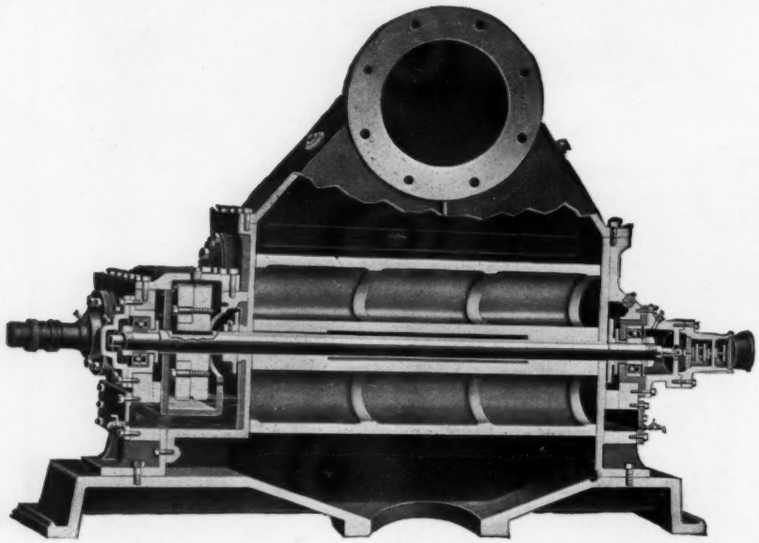

EMCO LOW PRESSURE BALANCED VALVE REGULATOR

PITTSBURGH EQUITABLE METER COMPANY

MAIN OFFICE AND WORKS PITTSBURGH, PA.

NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS TULSA SEATTLE KANSAS CITY SALT LAKE CITY

ROOTS



Accuracy in the Making

In the manufacture of the ROOTS Meter, Model SA, a high standard of accuracy is maintained at every operation. Step by step, the parts are made and assembled with the utmost precision and are carefully inspected. The extreme care of manufacture is, naturally, reflected in the finished meter. The ROOTS Meter, Model SA, gives the kind of long-lived performance that is expected of the finest quality, yet it is not too expensive for the smallest station. Its unqualified acceptance by the gas industry is the strongest evidence of ROOTS superiority. Write for details.

The P. H. & F. M. ROOTS CO.

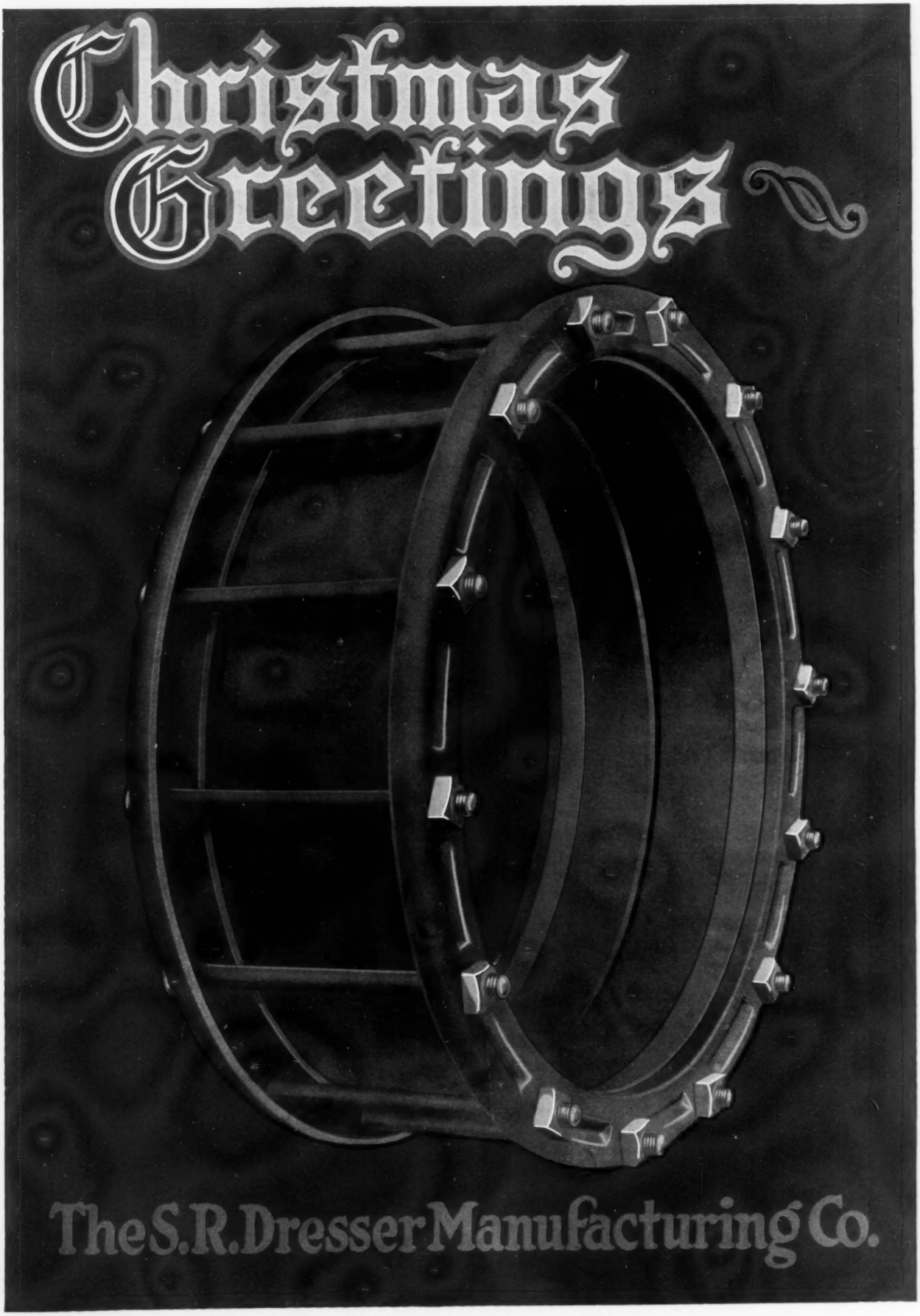
CHICAGO
Peoples Gas Building

CONNERSVILLE, INDIANA

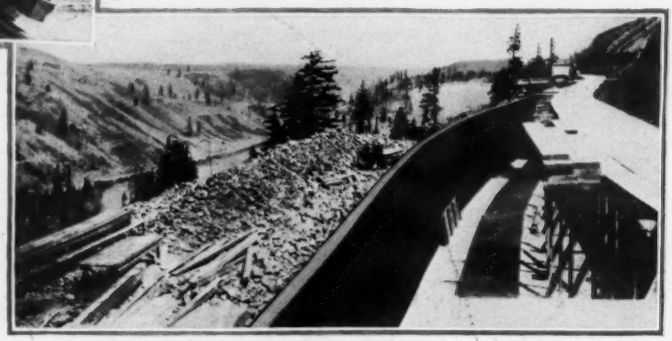
NEW YORK
120 Liberty Street

WESTERN REPRESENTATIVE: SUTOR & COMPANY, 2008 E. Slauson Avenue, Los Angeles, California

Originators of the Double Impeller Rotary Principle


Christmas Greetings
The S. R. Dresser Manufacturing Co.

Vertical Concrete Walls in *Government Project*



Cured by Hunt Process

A million and a quarter square feet on the U. S. Reclamation Project, Ellensburg, Washington. Here, the Hunt Process is beating the best results of old fashioned curing methods. Eliminates costly covering and sprinkling after removal of forms. By preventing evaporation of mixing water, this improved method of cure makes the concrete actually stronger.

In curing walls, the Hunt Process is first applied to the top directly after pouring—then over the entire surface as soon as the forms are taken away. That's all! The cure needs no further attention. With the original moisture sealed in, crystallization takes place to the very surface.

No matter what type of construction it may be, the Hunt Process gives you a more uniform cure, a more complete cure and a stronger concrete than any other method. Retaining walls, dams, bridge abutments, concrete pipes, reservoirs—all forms of concrete work, are easily, quickly cured.

Used on more than 325 jobs throughout the United States and not a single instance of failure! These facts have been proved through exhaustive tests made by State, county and city engineers as well as other impartial investigators. Ask for our illustrated booklet . . . "Curing Concrete Without Dirt and Water by the Hunt Process". Contains valuable data, details of tests and other information.

The largest paving contractors in many states now use the Hunt Process. Comparative tests of 296 cores show that it makes concrete paving 8½% stronger than dirt and water method.

Mc EVERLAST, INC.

[T.M. REG.]

1110 Board of Trade Bldg., Los Angeles, Calif.

Branch Office: 1314 Magnolia Bldg., Dallas, Texas

U. G. I.

MECHANICAL GRATE GENERATOR

for

CARBURETTED WATER GAS APPARATUS

COMPARE THE FACTS

Hand Fired Generator	*U. G. I. Mechanical Grate Generator*
Operation stopped for fuel charging.	Operation continuous (Charging time saved)
Hand charging inefficient and interrupts operating cycle.	Automatic charging at regular intervals without interruption of operating cycle.
Uneven fuel bed with hand charging.	Uniform fuel bed at all times.
Barring-down costly and destructive of linings.	No barring-down required and no linings to deteriorate at clinker zone.
Lessened efficiency of fire bed due to building up of ash and clinker.	Fire bed always in healthy condition due to continuous removal of ash and clinker.
Time lost and labor expense involved in shutting down and cleaning fires.	No time lost and no clinkering gangs needed as fire is automatically and continuously cleaned mechanically. Clinker ground up and discharged with ashes.
Good fuel lost with ashes or expense involved in reclaiming same.	Fuel lost with mechanical grate generator is negligible.
Capacity of set lowered on account of time lost in charging and cleaning fires.	Capacity of set increased on account of regular automatic charging and continuous cleaning of fire without shut-down.
Radiant heat of fire lost to atmosphere.	Radiant heat of fire used to produce steam in water jacket boiler.
Expense of shoveling and removing ashes after cleaning.	Ashes are collected in a bin and dropped periodically into industrial car or a conveyor.
Dirty generator room and operating floor. Hard labor under depleting conditions of intense heat and dirt.	Clean generator room and operating floor. Hard labor eliminated together with other poor working conditions.

THE U. G. I. CONTRACTING COMPANY

Division of

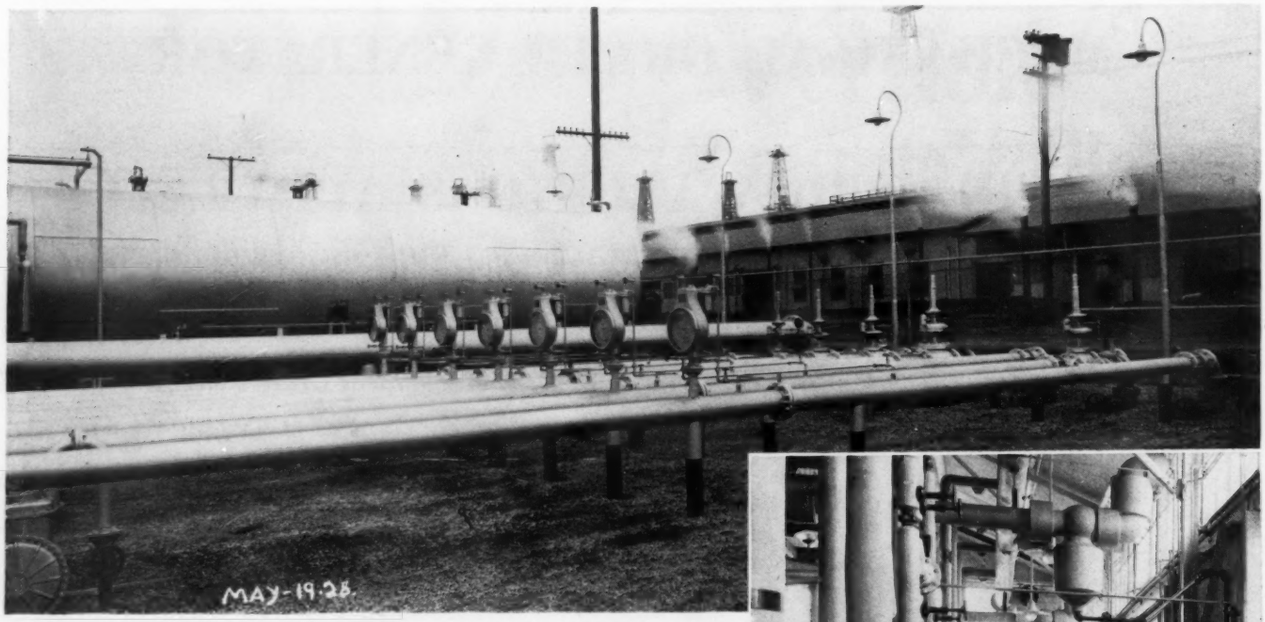
UNITED ENGINEERS & CONSTRUCTORS INC.

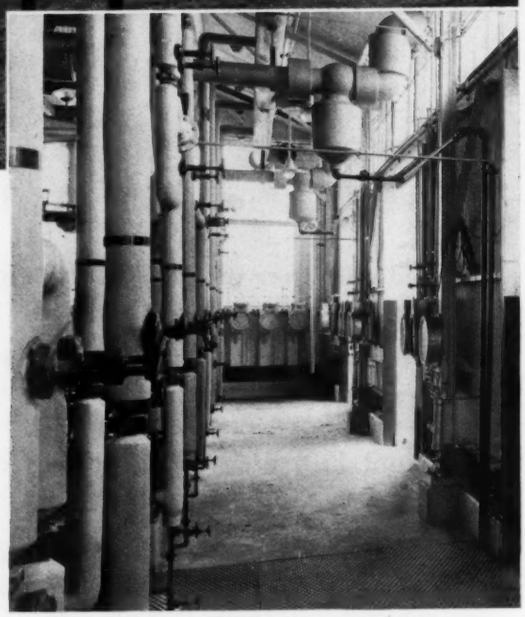
DWIGHT P. ROBINSON, *President*

PRINCIPAL OFFICE—PHILADELPHIA

CHICAGO ATLANTA

YOU SEE THEM EVERYWHERE





WESTCOTT METRIC ORIFICE METERS

THE ever growing popularity of the Westcott Orifice Meter, a product of the Metric Metal Works of the American Meter Company, is not a chance development. Proven accuracy and reliability, over a period of many years, is the primary cause. And this unfailing Westcott accuracy is the result of a quality of workmanship equalled only by the materials employed in construction.

The photographs above illustrate typical Westcott Orifice Meter installations. A master meter manifold is shown above. Below, meters for the measurement and control of vapors, oil, water and steam within the plant.

Our counsel is always available to Meter Men

WESTCOTT & GREIS, Inc.

SALES AND SERVICE

1945 Santa Fe Ave., (Trinity 8497) Los Angeles

WESTCOTT & GREIS

MEASUREMENT AND CONTROL

Help!
With Never a Glance at the Water Heater for Weeks!
When choosing your Water
—look beyond accepted
The Stairs That Lead
Yes--everyone says—
"Nothing like it
Has Your Home Modern Conveniences
You are entitled to this MODERN CONVENIENCE
Carefree Comfort Cleanliness

LET us help you! You cannot sell volume of automatic storage water heaters using hackneyed phrases of appeal. Threadbare, trite phrases do not stir the emotions to buy.

Easy sales—faster turnover —bigger profits—there is the goal of every merchant

Let us help you! There is a forceful, vigorous, convincing advertising campaign behind Rex Automatic Storage Water Heaters. Every month we offer to gas companies selling Rex Automatic Storage Water Heaters a mailing piece, that carries with it a refreshing appeal. Always new, always different, always giving a reason why.

And, by the way, the "quality merchandise" which gas companies like to sell is represented in Rex Automatic Storage Water Heaters.

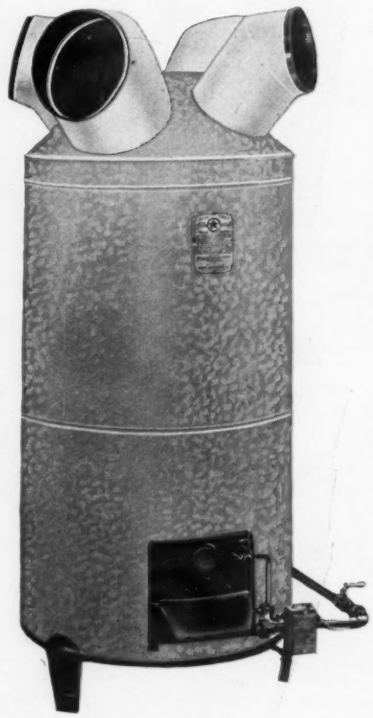
If you are not now handling Rex Water Heaters, write at once for prices and complete selling plan

THE CLEVELAND HEATER CO.

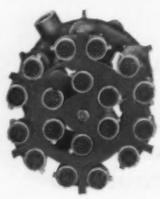
1900 West 112th Street Cleveland, Ohio

The Pacific Announces a New Line

of Unit Gas Furnaces Approved by the American Gas Association



This furnace is round instead of square. As a result there are no corners and no dead air spaces. There is better circulation because of the absence of corners. Consequently, heating is accomplished more quickly. The heating element is completely welded throughout, is gas tight, and permits no combustion fumes to escape. The heating unit is of 20-gauge pure Ingot Iron Toncan metal, known for its rust resisting qualities.



Pacific has devoted years to the development of this new furnace which now carries the BLUE STAR OF APPROVAL. Back of this approval is our 15 year old reputation as the leading and largest gas heating organization in the West.

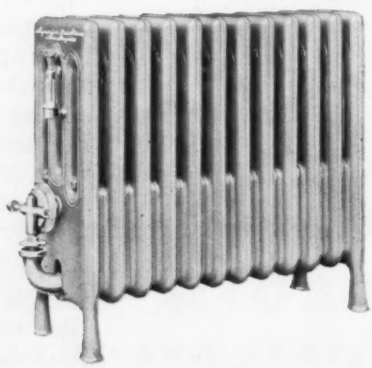
New Multi-Tubular Burner

Each burner has its independent injection of gas. Primary air for combustion is directly siphoned at each individual burner. There is no need for adjusting of the gas and air for combustion as this new Pacific Burner is scientifically designed to automatically give the correct proportion of air to gas. This results in complete combustion and a high temperature flame of proven economy. No soot. No odors.

Pacific Unvented Gas Steam Radiators Also Approved

By selling the Complete Pacific Line You Have the Advantage.

Because with the complete Pacific line you can offer the correct solution to every heating problem. Where other heating salesmen stress their particular appliance, our agent selects from a full line the appliance best suited. We have a real money making proposition. Write for particulars.



And NOW, Pacific Unvented Gas Steam Radiators, furnished in 4 column pattern 26, 32 and 38 inches high, carry A. G. A. BLUE STAR SEAL OF APPROVAL. In addition to this approval, the Pacific Gas Steam Radiators are approved by the Underwriters' Laboratories.

Pacific Gas Radiator

Gas Heating **Company** *Headquarters*

Roseberry and Walter Streets, Huntington Park, California

MANUFACTURERS *of* EVERY TYPE *of* GAS HEATING APPLIANCE

A Message to the Trade

Sales plans of the Pacific Gas and Electric Company for 1929, as in the past, are being prepared so as to promote dealer participation to the fullest extent.

Prices and terms for installment purchases will be such as to offer to the dealer an opportunity to cooperate with PROFIT to himself.

Advertising carried in newspapers and elsewhere will direct inquiries to the "NEAREST DEALER.

Statistical studies show clearly that of the possible field, only 10% can be covered by Company salesmen, leaving 90%—partly sold — available for cultivation by the dealers.

A united industry, working in harmony for the extension of gas service in the home will give the consumers the desired service and at the same time result in a greater volume of business for those participating.

Cooperation to the fullest extent is the foundation of our sales policies and we will welcome at any time constructive suggestions that will lead to better service for the public.

Our 1929 program will afford dealers many opportunities. For particulars communicate with our nearest office.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed
by Californians

245 Market Street
SAN FRANCISCO

H. M. CRAWFORD,
General Sales Manager.

No. 112

No. 65

No. 60

No. 102

No. 85

The Humphrey Radiantfire as a *Christmas Gift?* ---of Course!

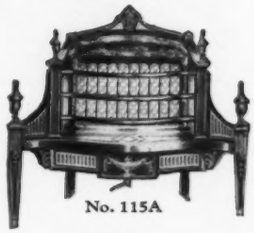
As a Christmas gift for the whole family, what is more enjoyable than a Humphrey Radiantfire? From that first Christmas morning, when the family gathers in front of the fireplace to enjoy its cheerful warmth, the Radiantfire will comfort the whole family. And it will add permanent beauty to the home, as well, for the Humphrey Radiantfire is not alone an article of utility, it is also a beautiful piece of furniture.

Cash in on the strong Christmas appeal of the Humphrey Radiantfire this year. Dress up your windows; concentrate your selling effort; make Santa Claus your star salesman, and you will reap profits for your effort.

No. 45

No. 30

No. 25


No. 115A

No. 80

The **HUMPHREY**

Radiantfire

Pacific Coast Manager
C. B. Babcock
135 Bluxome St.
San Francisco

Manufactured by
General Gas Light Co.
Kalamazoo, Mich.

WESTERN GAS

307 Thomas Building,
Dallas, Texas
Phone 2-8708

447 Sutter Street
San Francisco, Calif.
Phone GArfield 2772

Publication Office, 124 West Fourth Street
Los Angeles, Calif. Telephone TUcker 8982

Contents for December

Legislation and the Public Utility Industry 19
By Geo. L. Myers

The Domestic Trend 21
By L. J. Brundige

Pacific Coast Gas Association 23

Editorial 26

With the Metermen 28
Effect of Inaccuracies in Orifice Plates upon Gas Measurements
By E. H. Pann and J. C. Read

1928 Progress in Appliances and Equipment 33-56

Southwest Natural Gas Division to Convene 58

Mid-West Gas Association Offers Eighth Meter Short Course 64

JAY JENKINS
Publisher

GEORGE H. FINLEY
Managing Editor

ELLIOTT TAYLOR
San Francisco Manager

CRAIG ESPY
Mid-Continent Manager

Volume IV **December, 1928** **No. 12**

Official Publication: The Pacific Coast Gas Association; Southern California Meter Association

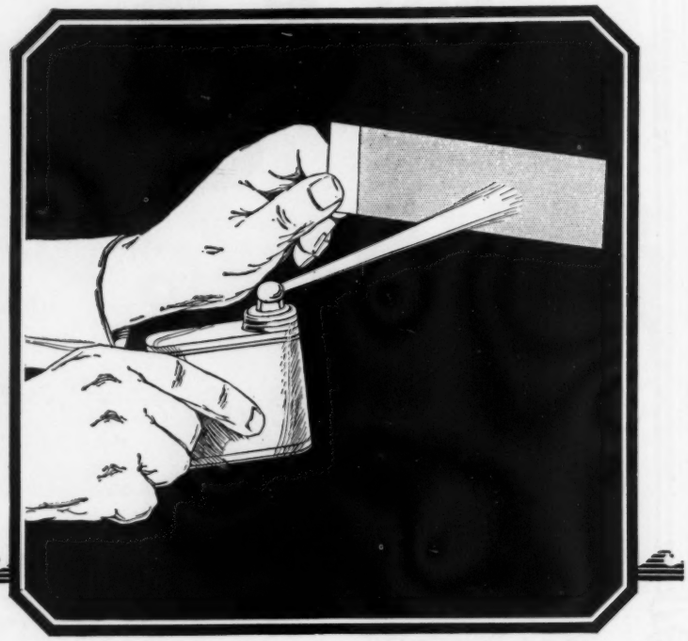
Western Gas is published by Western Business Papers, Inc. at 124 West Fourth Street. Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 3 years $5.00; $3.00 per year foreign. Entered as second-class matter June 1, 1925, at the postoffice at Los Angeles, California, under the Act of March 3, 1879.

Copyright, 1928, by Western Business Papers, Inc.

Western Gas *is fully protected by copyright, and nothing that appears in it may be reprinted without permission.*

These Tests Tell

Why L&S Portland Cement Paint offers INCREASED surface PROTECTION against Fire, Weather and Water—read below



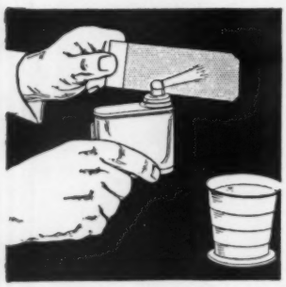


Figure 1
Here is a sheet of black iron coated with L & S Portland Cement Paint and made almost red hot with an alcohol flame. In spite of the terrific heat, the paint does not blister in the slightest degree. No better demonstration could be made to prove toughness and quality.

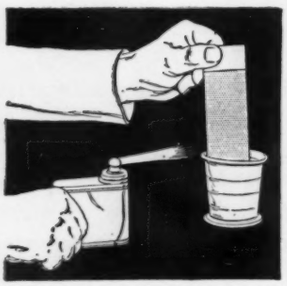


Figure 2
To further test the quality of L & S Portland Cement Paint, the sheet of black iron, while still hot, is immersed in cold water. This quick change from heat to cold has absolutely no effect upon the paint film.

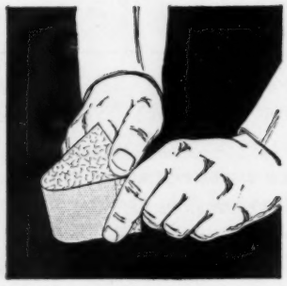


Figure 3
Demonstrating the extreme toughness of L & S Portland **Cement Paint.** Here it has been applied to ordinary galvanized iron sheet metal, untreated in any way before the application of the paint. Note that the metal has been bent double and yet there is no evidence of a crack or fracture in the film of paint.

Figure 4
Burning an ordinary paper clip painted with L & S Portland Cement Paint to show the extraordinary character of the paint film. The paper is quickly consumed, but the paint film remains intact, often in large pieces.

L & S Portland Cement Paint contains Portland Cement combined with other pigments ground in treated oils. The result is a paint with a film so hard that it carries all the virtues of cement, yet retains a high degree of elasticity. L & S Portland Cement Paint produces a close-grained, flat finish of cement-like texture.

L & S Portland Cement Paint is a heavy bodied paint, but it has the easy working and brushing qualities common to high-grade oil paints.

L & S Portland Cement Paint dries flat, with a hard film that will not crack, chip or rub off. It has unusual tenacity and hiding power.

When applied to roof surfaces—wood bridges and trestles, shingle roofs, mine timbers—surfaces that come in contact with electric firing, etc., L & S Portland Cement Paint greatly reduces the fire hazard.

The extent to which L & S Portland Cement Paint prevents the ignition of wood and other combustible building materials is truly remarkable, and this fire resistance is gained without sacrificing wearing or protective qualities as is often the case with other fire-retarding paints.

HILL, HUBBELL & COMPANY

(Division of General Paint Corporation)
Manufacturers of
Highest Grade Oil Industry Paints and Pipe Line Coatings
Factories: SAN FRANCISCO and TULSA
Offices
SAN FRANCISCO TULSA NEW YORK LOS ANGELES HOUSTON PORTLAND SEATTLE

WESTERN GAS

"Reg. U. S. Pat. Off."

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in *Western America*

SAN FRANCISCO **LOS ANGELES** **DALLAS**

Legislation *and the* Public Utility Industry

By GEO. L. MYERS

OUTSTANDING ON THE program of the P. C. G. A. Public Relations Section at the Coronado convention this year was this address by Geo. L. Myers. While the preliminary portion of the paper deals with the Federal Trade Commission investigation, later sections discuss other subjects bordering on legislation, such as competition in public utility service, the indeterminate permit, state regulation of governmentally operated utilities, taxation of governmentally operated utility properties, and making senior securities of public utilities eligible to savings and trust fund investment.

The author is assistant to the president of the Portland Gas & Coke Company, Pacific Power & Light Company, and the Northwestern Electric Company.

THE period covered by the Pacific Coast Gas Association year just closing does not include legislative proposals and enactments by the respective states within the geographic division of the Association for the reason that the legislatures of such states were not in regular session and for the further reason that no state elections were held submitting legislative proposals.

Geo. L. Myers

The legislative activity of the Association year of general concern to the public utility industry was the adoption by the United States Senate of Senate Resolution 83 authorizing an investigation of public utility corporations. The Resolution originally provided that the investigation should be made by a special committee of the Senate, but was amended to provide that the Federal Trade Commission should make it. The scope of the investigation included an inquiry into the growth of the capital assets and capital liabilities, methods and practices of finance, holding companies, their control, services, charges, finance and utility, and the publicity practices of public utility companies.

The Commission has been holding hearings which up to the present time have been devoted to publicity practices, dealing in the main with the practices of associations and information bureaus. There have been persistent and seemingly well organized endeavors to stigmatize these practices as vicious propaganda and to charge public utility companies with a purpose to subtly mould the opinion of the youth in our educational institutions.

The opportunity for the public utility industry to fully present the facts has not yet been given. There has been a seemingly willful effort in many instances to distort the facts disclosed and to seek to determine public opinion upon an exparte representation. Furthermore, some of the press and some of those who declaim from the public forum seem preverted enough to indict a whole industry for some indiscreet acts of a few. It is as if an indictment were brought up against all public officials because a few are proved crooked, or against the entire banking fraternity because a few of them violate their trust, or against a whole family because a black sheep happens to be among them. It is the voice of prejudice or ignorance finding expression in a spirit of unfairness or malice. The preponderance of high ethical standards among those affiliated with the public utility industry is just as great as it is among those of any other business, profession, art or vocation. Those of the industry have sought truthfully through legitimate channels to exercise their constitutional right to a free expression of their views and the facts about the industry by use of the written and spoken word and they do not intend to be intimidated or to relax in their efforts because of either abuse or misrepresentation. It is their purpose to give good service and to tell the people of the facts about that service and in doing so to win an even greater measure of public esteem. Let this challenge be thrown down to the opposition statesmanship at Washington, bring into the light of public scrutiny the publicity practices of those who seek government ownership through organized and subsidized activities.

Insofar as an attempt has been made to reflect unfavorably upon the relations of the industry with educational institutions, one can speak with authority only concerning the industry's relations with educational institutions in this geographic division of the Association coming within the preview of his knowledge. Within these limitations it can be stated that the industry has nothing to retract nor any apology to make for any of its relations. There has been no effort to subsidize or propagandize these institutions so as to influence the faculties or student bodies in their attitude politically toward the industry. All material of an informative nature that has gone into these institutions has been a candid and open presentation of irrefutable facts pertaining to the technique and economics of the industry and its relations with governmental bodies. There has been no argumentative literature or talks seeking to exploit or condemn any political or economic theory.

THERE is a real need disclosed by investigation for revision in many instances of material pertaining to the industry in the text books on economics and civics. Much material now used is baseless in fact. Much of it is obsolete. Much of it contains commentaries upon ethical standards in politics and business no longer prevalent. Much of it is obviously tinctured with a spirit of prejudice. Some newspapers, disdainful of facts and malicious in motive, have seen fit to unfairly attack the industry in its relations with educational institutions. This should give rise to no relaxation of effort upon the part of the industry to get a fair hearing as to the facts. Our attitude should not be one of supine submission to the injustice of unfair attacks. It should be one of persistent adherence and steady aggression to the end that those in our educational institutions may become possessed of the real facts.

(Mr. Myers at this point commented upon the declaration of principles by the two major political parties in the presidential campaign and the interpretation of them by the presidential candidates in their speeches of acceptance. It was pointed out that both parties disavowed federal regulation which would either duplicate or confuse the processes of state regulation and add complexity and expense to the administration and organizations of those who regulate and those who are regulated, and which would not adequately reflect local public sentiment and needs.)

The question of government ownership is not one of making comparisons between the results of government operation and private operation, because physical and economic characteristics are not usually identical, with, in consequence, an absence of comparable conditions. The question is more than one of comparative statistics which can be made to serve the purpose of anyone who may seek to justify government or private ownership. It has more than an economic significance. It involves a vital principle, the preservation and encouragement of individual initiative and enterprise which has brought this nation to its present laudable status in the economic life of the world. In an economic sense, the objectives of both government and private operations are alike, the lowest possible cost to the user for the service or commodity. The incentives are unlike, they being generally political power or preferment on the one hand, and legitimate profit under regulation on the other. While government may provide the service at cost, without the payment of any taxes, the privately operated public utility constantly endeavors to build up its volume so as to decrease the price for the service. The government is not in the business to earn a profit. Necessarily it will not have the same incentive as the privately operated enterprise to build up the volume use. Neither will it be as prudent to reasonably assure that all capital expenditures are justified by their potential revenue possibilities. The exigencies of politics will oftentimes ignore the wisdom of such a policy. The resources of a governmentally owned utility are limited only by the tax levying power of the community. The resources of the privately owned utility are limited to the success it can make of the enterprise. Responsibility in the first instance is rather widely diffused. In the latter instance it is definitely fixed. Executive direction is less permanent under government operation because of the changes in practical politics. It is more permanent under private operation because of the responsibility to private capital for successful operation. One needs only to understand the motives which actuate human conduct to conclude whether the incentive and responsibility of the governmental or privately operated utility are the most conductive to efficiency.

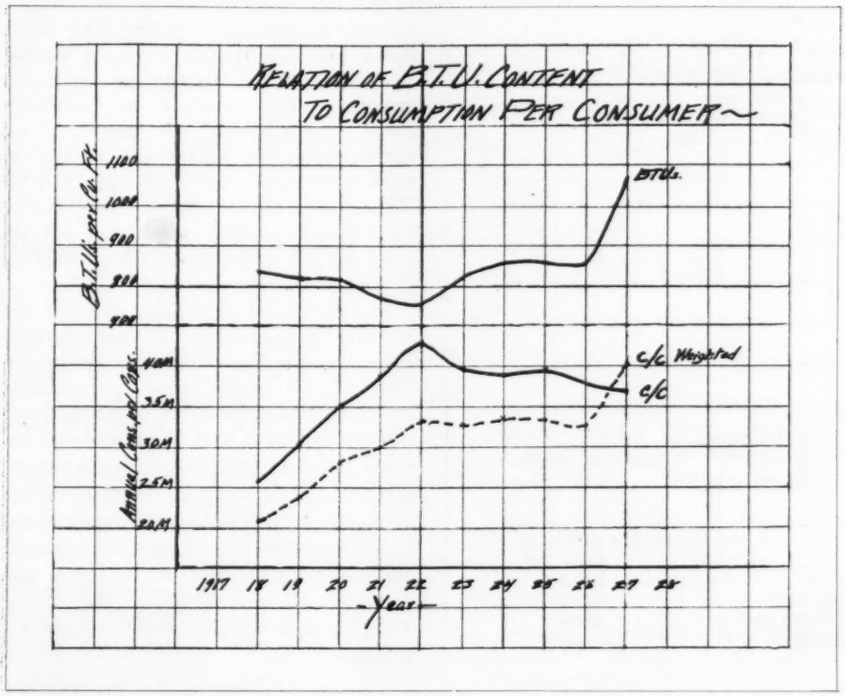
This subject cannot be passed by without an expression of this personal opinion, that the growing integration among the basic enterprises of industry and commerce will, within a reasonable time, give rise to an era of agitation in behalf of government ownership of a nature not so limited as at present. Then these basic enterprises will have a full appreciation of the effect of those political attacks, and the public utility industry will not stand alone as the object of political exploitation. Out of it will come a greater appreciation of the interdependence of industry and commerce and the public utility industry will not be without that measure of co-operation to which it has been entitled in defending the principles of free development of private initiative and enterprise and fair competition.

This discussion would be incomplete were it to review only the legislative development of the present Association year. There is need for certain fundamental principles governing the functions and growth of the public utility industry of uniform application among the states coming within the jurisdiction of the Association. They can become effective only through legislative action. A few of them already a part of some of our public utility statutes.

Competition in public utility service of an identical nature is no longer justified under a policy of governmental regulation except upon facts substantiating the need and desirability of it. In fact, it becomes an economic fallacy, because regulation is presumed to do what competition cannot or can do. When government intervenes to determine the fair value of useful property and the return that may be earned upon it, and prescribes the charges that may be made for service and the conditions under which it must be rendered the usefulness of competition ceases. Those empowered to regulate then, as a necessary corollary, should be given the authority to permit or deny competition of identical service. This has been done in most of our states by vesting regulatory authorities with power to issue certificates of public convenience and necessity before any competition may ensue. This power does not arbitrarily preclude competition. It merely provides that competition cannot be countenanced except upon satisfactory proof that the convenience and need of the public will be subserved thereby. It would be obviously unwise and unjust to arbitrarily preclude competition by legislative fiat and it could not be sustained as a bulwark against scientific progress.

THE indeterminate permit is not a part of the public utility statutes of any one of the states within the territory of the Association. It should be effective in each state. A franchise should not be granted, in perpetuity nor with a limited tenure. A franchise of limited tenure complicates problems of finance. It makes the investment of money less attractive and the cost of it greater; consequently, the ability to expand is more restricted and necessarily the cost of service greater with increased cost of money and the sacrifice of added revenues which ultimately result from expansion. Therefore, both the public and the utility lose. Furthermore, the fact that the operations of a public utility company are no longer limited to a single community but almost without exception extend into many communities

(Continued on Page 32)



AT LEFT

Chart No. 1—A weighted consumption per consumer curve

The Domestic Trend

By L. J. BRUNDIGE

*Pacific Gas and Electric Company**

THE work of the Domestic Gas Sales Committee this year has been planned to cover a study of the conditions as they actually exist at this time on the Pacific Coast, the principal factors which have brought about these conditions, and a possible solution of the present unfavorable trend in the sale of gas to domestic consumers.

In order to properly analyze and classify this information the report has been divided into the following parts:

A. Trend in Gas Consumption per Consumer.
B. Unprofitable Consumers.
C. Opportunities for Load Building.
D. Effect of Habits of Living on Gas Consumption.
E. Competitive Appliance Sales
F. Merchandising Policies.

The data used in this report have been largely taken from a questionnaire which was mailed to committeemen. These committeemen represent approximately 80 per cent of the total number of gas consumers on the Pacific Coast.

Conclusions have been drawn from answers to the questionnaire.

A. Trend In Consumption:

It has been an established fact for some time that the gas consumption per consumer over the United States as a whole has been gradually decreasing. In analyzing the trend in domestic gas consumption per consumer for the gas companies on the Pacific Coast it has been found that an actual decrease in gas consumption per domestic consumer does not exist when all of the territory is taken into consideration. It is a fact, however, that certain areas, particularly large cities, are showing a decrease in consumption per consumer. This may be largely attributed to the addition of consumers who use only a small amount of gas and not so much to an actual decrease in usage of consumers who have been connected to our lines for the past ten years.

It is further apparent that practically no increase in gas consumption per consumer has been shown during the last five years and it is this condition with which we are most concerned.

Effect of Natural Gas: In the southern part of California companies which formerly served manufactured gas have gradually changed over to natural gas. With this change, the heat content of the gas sold has been increased. Consumption per consumer will decrease if the B.t.u. content of the gas increases, providing appliances are properly adjusted.

The substitution of natural gas for manufactured gas in southern California has therefore brought about a general decrease in consumption per consumer. This decrease has been offset to some extent by an over-all increase in actual consumption.

Chart No. 1 has been prepared to show the relation between the B.t.u. content of gas and the trend in consumption per consumer over a period of nine years for a Southern California gas company. The form of the B.t.u. curve is almost exactly the reverse of the form of the consumption per consumer curve, indicating that consumption per consumer has varied inversely with the heat content.

In 1927 the heat content of the gas was increased about 200 B.t.u. The drop in this case, however, in consumption per consumer was not in proportion to the amount of increased heat content. This might be explained by the fact that the appliances being served were not immediately adjusted to use the higher B.t.u. value of gas, thus resulting in inefficient operation and necessitating the use of at least as much gas as before to do the same amount of work.

Included on Chart No. 1 there is also a weighted consumption per consumer curve. This curve has been plotted by adjusting the amount of gas consumed per consumer to compensate for the change in heat content, thereby eliminating the variable. The curve actually shows whether or not an increase or decrease in consumption per consumer has occurred. As a matter of fact, it appears that the consumption per consumer in 1922 is the same as in 1926 after weighting the curve according to the heat content.

In general all gas companies show a rapid increase in consumption per consumer during the five year period between 1917 and 1922 with only a very slight increase during the five years between 1922 and 1927.

In view of the fact that the amount of increase in consumption per consumer appears to be growing smaller each year, the question arises as to whether or not

*1928 report of the Pacific Coast Gas Association's Domestic Gas Sales Committee, L. J. Brundige, chairman.

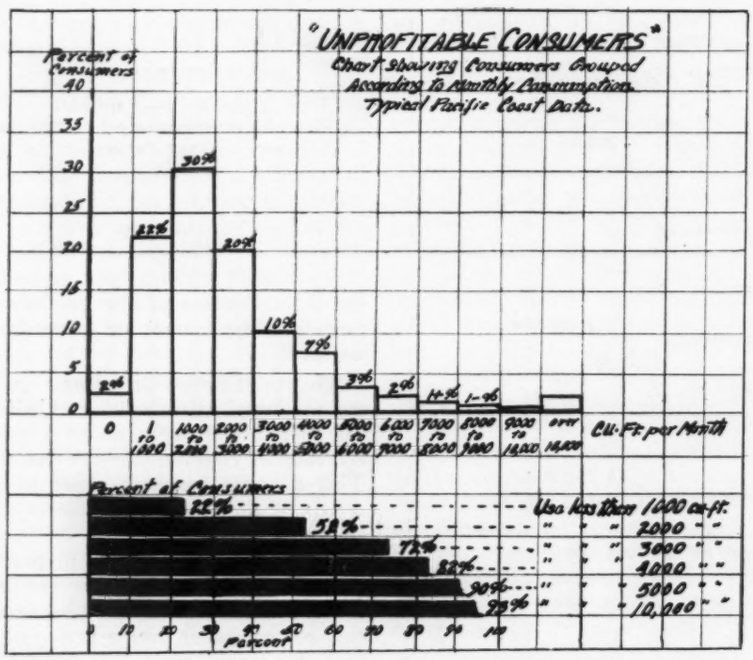


Chart No. 2

this very important item will actually show a decrease in the near future.

B. Unprofitable Consumers

The elimination of "minimum" or unprofitable consumers from our accounts presents a problem in itself. Rate making departments have already considered the problem with a view of fixing minimum charges at a point which will compensate the serving company for at least its fixed investment and operating expenses. Commercial men might well consider this problem with a view of solving it through increased sales effort directed at this particular class of consumers.

The American Gas Association has compiled figures which indicate that approximately 38 per cent of our gas consumers show an absolute loss while 33 per cent are only paying operating expenses. This leaves a balance of 29 per cent which pay more than a fair return on the investment and cost of manufacture.

It is difficult to make a general statement as to the percentage of minimum or unprofitable consumers which exist on the Pacific Coast because of the wide variation of investment per consumer between the various companies. This percentage would also be affected by the consumption per consumer and the class of territory served.

Chart No. 2 has been prepared to show the general classification of our consumers according to their monthly consumption of gas. Definite information could not be obtained from a majority of the companies on the Pacific Coast and the figures used represent an average between national figures and figures obtainable on the Pacific Coast.

It is significant to note that approximately 22 per cent of our consumers use less than 1000 cubic feet of gas per month, 52 per cent use less than 2000; 75 per cent use less than 3000 cubic feet. The first block of consumers, namely those using less than 1000 cubic feet per month, may be classed as unprofitable consumers since they do not contribute to the net profits of the serving company.

It is apparent that the majority of consumers, or those using less than 3000 cubic feet per month, are not taking advantage of the various uses afforded by gas. For example—an ordinary home with a cabinet gas range and an automatic water heater should use at least 4000 cubic feet of gas per month. This wide field of unprofitable consumers offers unlimited opportunity for increasing gas consumption per consumer.

C. Opportunities for Load Building:

Surveys made in various parts of the territory indicate that many of our consumers do not have the necessary gas appliances for using even a reasonable amount of gas. Inferior, inadequate appliances which have been in use for many years are considered typical gas appliances. The story of the modern gas appliance with its improvements has not as yet reached 90 per cent of our consumers and they continue to judge and condemn all gas appliances because of their own worn-out, unsatisfactory appliances.

Inadequate Cooking Equipment: Actual house-to-house surveys indicate the following distribution of appliances for cooking purposes:

Cookers, Hotplates and Combination Stoves	28%
Cabinet type gas ranges	57%
No gas for cooking	15%

It is apparent from an analysis of this survey that a great many of our consumers are prospects for modern gas equipmen. The survey indicates that approximately 57 per cent of our consumers are using the cabinet type of gas range. It can not be assumed from this, however, that these gas ranges are of the most modern type. Probably not more than one-fifth of these cabinet type gas ranges have oven heat controls. Very few have closed tops and automatic lighters.

(Continued on Page 30)

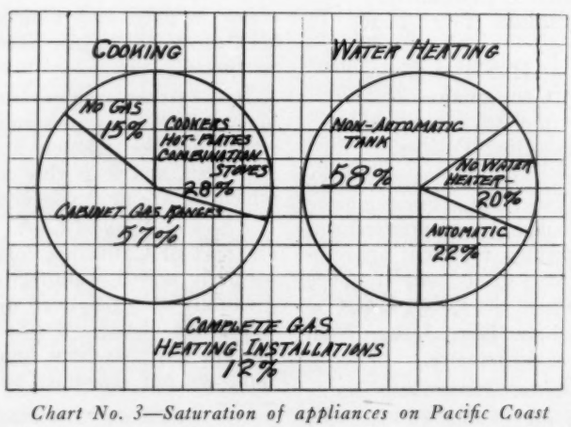


Chart No. 3—Saturation of appliances on Pacific Coast

PACIFIC COAST GAS ASSOCIATION

447 Sutter Street, San Francisco, California

A Department Conducted by Clifford Johnstone, Executive Secretary

November Meetings Advance Committee Set-up

Commercial Section

CLYDE H. POTTER, *General Chairman*
J. EARLE JONES, *Vice-Chairman*
H. R. BASFORD, *Vice-Chairman*

A SPIRITED meeting of the Commercial Section of the Pacific Coast Gas Association was held in the Florentine Room of the Fairmount Hotel, San Francisco, on Friday, November 23rd. There was a morning and an afternoon session, punctuated by the noon luncheon in which members of the Commercial Section joined with the representatives of other sections. Clyde H. Potter, chairman of the Commercial Section, presided.

Clyde H. Potter

Exactly 50 representatives of the Commercial Section participated in the day's deliberations. After calling the meeting to order, Chairman Potter outlined briefly the organization plans of the Section. Reference was made to the three recent Commercial Regional meetings. The first was held at Los Angeles on October 29th, Mr. Potter presiding. A second took place in San Francisco on the evening of November 7th, Vice-Chairman Harold R. Basford presiding. The third was called by the Northwestern vice-chairman, J. Earl Jones, and was held in Portland, Oregon, on November 16th.

The Chair appointed Frank C. Packer to act as Secretary for the meeting.

The first speaker on the morning program was Hal King, commercial manager of the National Broadcasting Company, who gave a 20-minute talk on radio broadcasting via "The Woman's Magazine of the Air." Mr. King discussed the possibilities of a gas industry broadcasting plan, which created interest not only among gas company representatives but among appliance manufacturers and representatives present. Owing to the public relations angle involved, Mr. Potter invited the Public Relations Section to hear Mr. King's talk.

Association Calendar

Commercial Section Meeting, in connection with Western Metals Congress—Middle of January, Los Angeles, Calif.

Pacific Coast Conference, A. G. A. Advisory Council and Executive Board—Los Angeles, February 6-7.

Commercial Section, Northwest Meeting—Tacoma, Washington, Feb. 1.

Annual Convention — Del Monte, week of September 11, 1929.

That coastwide gas industry advertising struck a responsive chord was evidenced by the favorable discussion which followed. As explained by the chairman of the Section a strong undercurrent of the need for some concerted action on the part of the gas industry to make the public "gas conscious" was everywhere in evidence. It was the same feeling that was manifested at the Coronado convention.

C. B. Babcock, president of the C. B. Babcock Company, presented a resolution containing 21 planks, calling for definite, concerted action in a Pacific Coast gas industry advertising program. The motion to adopt this resolution was made by R. J. Thompson, seconded by N. R. McKee and unanimously carried.

Following is the platform of twenty-one planks subject matter by Mr. C. B. Babcock:

1. Gas sales are vital to existence of Utility.
2. Gas will not sell itself.
3. Competition from many sources outside of realms of Public Utilities.
4. Importance of sales promotion accepted.
5. How shall we promote sales.
6. How much of gross income should be spent in sales promotion through all channels.
7. Suggested 3-5% of gross domestic and commercial income.
8. How shall this money be spent.
9. Three major avenues—salesmen, advertising, improved rates.
10. Proper assignment of budget—2/3 to direct selling, 1/3 to advertising, cost of rate improvement chargeable to general overhead.
11. First in importance to accomplish our objective—sales department and public relations.
12. Gas Company Leadership in sale of appliances and dealer co-operation and dealer education.
13. Direct selling of appliances by all Gas Companies and maintenance of prices and ethical business methods.
14. Commission plan of remunerating salesmen best method.
15. Commission paid to any employee turning in prospect which is closed by sales department.
16. Advertising—embracing all phases—Newspaper, direct mail, radio, window and floor display, billboard. (Morale builder).
17. Attempt to create a desire for cooked foods—convenient and clean ways of heating. Home laundering, frequent baths, incineration of garbage.
18. Healthful aspects of gas fuel.
19. Development of heating. Domestic and industrial uses of gas.
20. Education of all employees to advantages of gas.
21. Strict rules governing quality appliances installed on gas mains and plan to eliminate obsolete and inefficient appliances now installed.

Another motion stipulating that plans be formulated to raise funds for co-operative advertising, same to be presented to the Pacific Coast Gas Association directors at the next meeting, was unanimously adopted. This motion aswed that the chair immediately appoint a committee with authority to act. The chair appointed the following committee:

F. S. Wade (Chairman), President, Southern Counties Gas Company.
A. B. Macbeth, President Southern California Gas Company.
R. E. Fisher, Vice-President Pacific Gas and Electric Company.
Addison B. Day, President Los Angeles Gas and Electric Corporation.
L. M. Klauber, General Superintendent San Diego Consolidated Gas and Electric Company.
Harry W. Jackson, Vice-President James Graham Manufacturing Company.
C. B. Babcock, President C. B. Babcock Company.
George L. Myers, Assistant to the President, Pacific Power and Light Co.

The afternoon session was opened by a comprehensive talk on the part of A. F. Rice of the H. R. Basford Company on this subject, "Gas, the Ugly Duckling."

Mr. Rice outlined his ideas as to the attitude that the public in general holds toward the gas industry, emphasizing the fact that the public is no longer "gas conscious," but on the other hand is thinking only in terms of "doing it electrically."

Mr. Rice's paper was an amplification of Mr. Babcock's platform of 21 reasons why the industry must resort to advertising, "not next year or at a later date, but *now!*"

The matter of obtaining a confidential appliance sales record of all gas appliances sold within the territory covered by the Association was approved. This record will be obtained by the Executive Secretary through a questionnaire which will be sent to all company and gas appliance manufacturers, members of the Pacific Coast Gas Association. The individual reports to the Secretary will be kept confidential, only the totals to be made public to Association members. A copy of the questionnaire was exhibited to those present.

Announcement of all committee chairmanship appointments and committee personnel was made by the Chairman, as detailed below.

No definite meeting place for the Section's next conference was announced, but it was suggested that a Commercial Section meeting be held in Los Angeles during January, at which time the Western States Metal and Machinery Exposition and Western Metal Congress will convene in that city.

On Saturday morning, November 24, the Chairman called a special meeting of the Section which was held in the Furniture Exchange Building. It was urged that the Commercial Section recommend to the Board of Directors that $500 be paid by the Association to the California Development Association to support the latter's Ordinance Code work. The Association's Secretary would, in the advent of the approval of the Board, act as contact between the Association and the California Development Association.

COMMERCIAL SECTION ORGANIZATION FOR 1929

C. H. Potter, General Chairman, Southern Counties Gas Co.
J. Earl Jones, Northwest Vice-Chairman, Portland Gas and Coke Co.
H. R. Basford, Central Vice-Chairman, San Francisco.

COMMITTEES

Executive Committee

This committee includes representatives of Class A and Class B members of the Association.

Domestic Sales

A. B. Stryker, Chairman, Pacific Gas and El. Co.
Sidney Beck, Estate Stove Co.
L. Cinq-Mars, Humphrey Co.
R. W. Coblenz, Portland Gas & Coke Co.
C. H. Dickey, Jr., Hot-N-Kold Corp.
W. L. H. Geldert, Southern Counties Gas Co.
H. F. Hall, Holbrook, Merrill & Stetson.
W. M. Hamilton, Portland Electric Power Co.
M. W. Gahan, Coast Counties Gas & Electric Co.
O. R. C. Grow, Southern Counties Gas Co.
M. C. Hancock, Washington Gas & Electric Co.
E. J. Hinchey, Jas. Graham Mfg. Co.
L. A. Hubbs, California Servel, Inc.
S. R. Hutchinson, Seattle Lighting Co.
Rudolph Jenny, Pacific Gas and Electric Co.
W. M. Kapus, Northwest Gas & Electric Equipment Co.
Ed Marshall, Madera Gas Co.
A. C. Miller, Pacific Gas and Electric Co.
W. W. Norton, Electrogas Furnace Co.
C. Roy Onimus, Hammer-Bray Co.
Andrew Kerr, Steiger & Kerr Stove and Foundry Co.
John Redd, Los Angeles Gas & Electric Corp.
W. F. Suess, Southern California Gas Co.
H. M. Thomas, Pacific Power & Light Co.
R. J. Thompson, Welsbach Co.
Morris Wales, Coast Counties Gas & Electric Co.

Domestic Sales Sub-committee on Heat Conservation

Leo Kroner, Chairman, Portland Gas & Coke Co.
Dan Barnes, Seattle Lighting Co.
Dozier Finley, Paraffine Cos., Inc.
F. H. Hewlings, British Columbia Electric Power & Gas. Co.
B. L. Shera, Washington Gas & Electric Co.

Domestic Sales Sub-committee on Refrigeration

H. E. Seagraves, Chairman, Washington Gas & Electric Co.
J. C. Blair, National Refrigerating Co.
R. C. Finch, Portland Gas & Coke Co.
J. H. Gumz, Pacific Coast & Electric Co.
L. A. Hubbs, California Servel, Inc.
J. Fremont, British Columbia Electric Power & Gas Co.
Ed Kern, Southern California Gas Co.

Industrial Sales, Manufactured Gas

L. C. Haffner, Chairman, Portland Gas & Coke Co.
Robt. Carver, British Columbia Electric Power & Gas Co.
Wm. Duggan, Northwest Gas & Electric Equipment Co.
J. H. Gumz, Pacific Gas & Electric Co.
Herbert Haas, Pacific Gas & Electric Co.
A. A. Knernshield, Seattle Lighting Co.
R. J. Phillips, San Diego Cons. Gas & Electric Co.
Fred Schwab, Washington Gas & Electric Co.
H. E. Seagraves, Washington Gas & Electric Co.
Ray Trowbridge, Pacific Gas & Electric Co.

Industrial Sales, Natural Gas

George Bowersox, Chairman, Southern California Gas Co.
Allen T. Fesler, Santa Maria Gas Co.
D. L. Leahy, Southern Counties Gas Co.
C. A. Thorp, Los Angeles Gas & Electric Corp.

Advertising and Publicity, Southern Committee

Frank Weiss, Chairman, Los Angeles Gas and Electric Corp.
J. C. Gilbert, Southern Counties Gas Co.
C. M. Grow, Southern California Gas Co.
Guy Kendall, Northwest Gas & Electric Equipment Co.
Ross Munro, Jas. Graham Mfg. Co.

Advertising and Publicity, Central Committee

C. Roy Ohnimus, Chairman, Hammer Bray Co.
A. L. Adkins, Pacific Gas and Electric Co.
C. B. Babcock, C. B. Babcock Co.
J. C. Douglas, Hot-N-Kold Corp.
Harry Jackson, James Graham Manufacturing Co.
Andrew Kerr, Steiger & Kerr Stove and Foundry
M. F. Wales, Coast Counties Gas & Electric Co.

Advertising and Publicity, Northwest Committee

J. H. Hartog, Chairman, Portland Gas & Coke Co.
J. H. Adams, Mountain States Power Co.
John Condon, Condon Co., Tacoma, Wash.
W. M. Kapus, Northwest Gas & Electric Equipment Co.
Jas. Lightbody, British Columbia Electric Power & Gas Co.
J. F. McIndoe, American Radiator Co., Portland.
V. Moon, Pacific Power & Light Co.
G. M. Stow, Seattle Lighting Co.

Architects and Builders Cooperation

C. P. Hering, Chairman, Pacific Gas and Electric Co.
W. S. Dicken, Puget Sound Power & Light Co.
C. A. Bougher, Utah Gas & Coke Co.
H. W. Elder, San Diego Cons. Gas & Electric Co.
I. C. Gilbert, Southern Counties Gas Co.
N. O. Fratt, Seattle Lighting Co.
M. C. Hancock, Washington Gas & Electric Co.
John Keillor, British Columbia Electric Power & Gas Co.
W. J. Lane, Turlock Gas Co.
J. F. McIndoe, American Radiator Co., Portland
Frank Moon, Los Angeles Gas & Electric Corp.
Fred Schwab, Washington Gas & Electric Co.
H. E. Seagraves, Washington Gas & Electric Co.
A. G. Smith, Portland Gas & Coke Co.
H. M. Thomas, Pacific Power & Light Co.
H. L. Warren, Southern California Gas Co.

Advisory Rate Committee

L. F. Galbraith, Chairman, Pacific Gas and Electric Co.
C. B. Babcock, C. B. Babcock Co.
H. R. Basford, H. R. Basford Co.
C. Y. Bowers, Washington Gas & Electric Co.
Geo. P. Egleston, H. R. Basford Co.
C. M. Grow, Southern California Gas Co.
F. K. Lane, Seattle Lighting Co.
A. O. Leach, Portland Gas & Coke Co.
W. T. Neill, Pacific Power & Light Co.
F. W. Olsen, Mountain States Power Co.
A. A. Salmon, Spokane Gas & Fuel Co.
H. E. Seagraves, Washington Gas & Electric Co.
S. Terry, Aladdin Heating Corp.
A. W. Young, Pacific Gas and Electric Co.

Ordinance Committee

C. M. Grow, Southern California Gas Co.
Wm. Addy, Seattle Lighting Co.
C. Y. Bowers, Washington Gas and Electric Co.
C. R. Miller, Portland Gas & Coke Co.
C. H. Porter, Southern Counties Gas Co.
Geo. C. Sawyer, Pacific Power & Light Co.
J. L. Stone, Spokane Gas & Fuel Co.
Frank Talcott, Pacific Gas and Electric Co.
Frank Weiss, Los Angeles Gas & Electric Sorp.

Sales Budgets

C. R. Miller, Chairman, Portland Gas & Coke Co.
W. J. Cady, Portland Gas & Coke Co.
A. B. Dobb, Seattle Lighting Co.
J. Fremont, British Columbia Electric Power & Gas Co.
Lee Holtz, Southern California Gas Co.
F. U. Naylor, Pacific Gas and Electric Co.
Geo. Smith, Southern Counties Gas Co.

Ways and Means

F. S. Wade, Chairman, Southern Counties Gas Co.
R. E. Fisher, Pacific Gas and Electric Co.
Addison B. Day, Los Angeles Gas & Electric Corp.
Geo. Myers, Portland Gas & Coke Co.
A. B. Macbeth, Southern California Gas Co.
Harry W. Jackson, James Graham Manufacturing Co.
C. B. Babcock, C. B. Babcock Co.
L. M. Klauber, San Diego Consolidated Gas and Electric Co.

New Uses for Gas

E. M. De Remer, Chairman, Southern California Gas Co.
K. Dazey, Southern Oregon Gas Corp.
O. R. C. Grow, Southern Counties Gas Co.
J. Earl Jones, Portland Gas & Coke Co.
C. E. Lasher, Washington Gas & Electric Co.
D. O. Oldham, Seattle Lighting Co.
F. W. Olsen, Mountain States Power Co.
A. A. Salmon, Spokane Gas & Fuel Co.
H. E. Seagraves, Washington Gas & Electric Co.
Ed Taylor, British Columbia Electric Power & Gas Co.
Jessica Taylor, Los Angeles Gas & Electric Corp.
H. M. Thomas, Pacific Power & Light Co.

A. G. A. Advisory Council to Meet in L. A. in Feb.

AT the meeting of the Executive Board of the American Gas Association, held November 21 at Association Headquarters, New York, N. Y., it was decided to accept the invitation extended by C. H. Dickey, president of the Pacific Coast Gas Association, in behalf of the officers of this Association, to hold an executive conference on the Pacific Coast in February.

F. S. Wade

The meeting will be held the first week in February, and the following committee on arrangements and program has been appointed by Oscar H. Fogg, president of the American Gas Association:

Chairman, Franklin S. Wade, Los Angeles, Calif.; S. W. Meals, Pittsburgh, Pa.; H. Leigh Whitelaw, New York, N. Y.; H. C. Abell, New York, N. Y.; Clifford Johnstone, San Francisco, Calif.; A. B. Day, Los Angeles, Calif.; and K. R. Boyes, New York, N. Y.

Mr. Wade has appointed a committee on local arrangements, made up of N. R. McKee, chairman; N. L. Morse; T. B. Parks; W. M. Thompson; C. D. Weiss.

Accounting Section

B. H. PARKINSON, *General Chairman*
D. G. MARTIN, *Vice-Chairman*

AN executive committee meeting of the Accounting Section was held on November 23, 1928 in the Fairmount Hotel, San Francisco, California.

The purpose of the meeting was to discuss the new plan of organization of the Accounting Section and to outline the work of committees for the administrative year.

B. H. Parkinson

The following permanent plan of organization of the Accounting Section was approved.

Executive Committee

Chairman—Chairman of Accounting Section

Vice-Chairman — Vice-chairman of Accounting Section.

Members composed of senior accounting officers of each member company.

Scope of activity of Executive Committee:

First:

To advise with the Section Chairman in regard to programs for meetings and studies to be undertaken by the Accounting Section.

The Pacific Coast Gas Association is an excellent laboratory for working out specific problems of member companies. True, a member company can not always apply, in its every detail, a plan or system which has been worked out by the Accounting Section, but the member company can invariably apply a section of the study or the principle of the study to valuable advantage. The life blood of the association is the exchange of ideas of a representative group of the industry.

Second:

To make committee appointments.

All requests for committee appointments are to be addressed to the Executive Committee member representing the company in which the committee appointment is desired. The best type of committeeman is one who is currently engaged in the particular line of work under study—one who may feel that he has the full approval of his senior to carry on the study and participate in Assocation work. Who is better qualified to make committee appointments than the senior accounting officer?

It should be borne in mind that the greatest benefit from committee work accrues to the committeeman and the company which he represents.

Third:

The selection of the Accounting Section Vice-Chairman.

It is quite important that this responsible position in our organization be filled by a man who is not only capable but who will also be permitted by his senior company official to carry on the work and attend the meetings and Annual Convention.

Standing Committees:

The field of the Accounting Section has been broken up into six general sections with a standing committee in charge of each section. As subjects for study are recommended by the Executive Committee they will be classified by the Section Chairman and passed on to the proper Standing Committee Chairman. The Standing Committee Chairman may elect to have a study presented as a paper by a member of his committee or presented as a section of the Committee report.

SCOPE OF ACTIVITIES OF STANDING COMMITTEES

Classification of Accounts Committee:

To endeavor to secure the adoption of the Uniform Classification of Accounts and standard form of annual reports by all member companies and by regulatory commissions having jurisdiction over accounting procedure and to assist in their interpretation and application. A sub-committee in the State of California to assist in the interpretation and application of the classification of the Federal Power Commission.

Customers' Records Committee:

To study and report on methods applicable to customers' records and billing, customers' deposit practices, meter reading record, policies relating to credits and collections, merchandise sales, customers' billing and collections, machine billing and allied subjects, including consideration of customer relations.

Fixed Capital Committee:

To study and report on methods for preparation and maintenance of fixed capital records, work order systems, estimates for construction requirements, distribution of capital expenditures, and overhead expenses on construction.

General Records Committee:

To study and report on methods applicable to accounts payable, practices for general ledger and subsidiary records, other than customers' records; pay roll, tax, insurance and interest records; internal auditing; filing systems, preservation of records; automotive equipment accounting and records; operating cost accounting.

Purchasing and Storeroom Committee:

To study and report on systems of purchasing, storing and accounting for and issuing materials and supplies, purchasing agent's record requirements, methods and allied functions.

Statistics Committee:

To study and report on statistical methods, both company and national, including standards in terminology, reporting forms and graphic presentation; to assist in the preparation and collection of national statistics for the gas industry and local statistics for the Pacific Coast Gas Association.

the Pacific Coast Gas Association; collect and prepare statistics for other sections of permit the incoming Section Chairman to hold an Executive Committee Meeting during the annual meeting of the Association and announce his committee appointments and committee assignments during the closing hours of the Accounting Section sessions.

STANDING COMMITTEE ASSIGNMENTS FOR THE ADMINISTRATIVE YEAR OF 1928-1929

Classification of Accounts Committee:

Survey of the local situation to determine whether or not this year is an opportune time to undertake to secure the adoption of the National Classification of Accounts for gas companies and standard forms of the National Reports by any or all of the Regulatory Commissions in Pacific Coast states except the State of California. To assist in interpreting, and to consider recommendations for changes or additions to, the National Classification (Federal Power Commission Classification in the case of the State of California).

Customers' Records Committee:

Advantages and disadvantages of prompt payment discount on service bills.

Interchange of credit information between public utilities.

Standard application for service.

A review of customers' deposit policies.

Advantages and disadvantages of bi-monthly billing.

Wrinkles in customers' billing.

Note: Although it seems unnecessary to review the matter of customer billing each year there is always some new idea brought out pertaining to customer billing which may be added to existing methods without radical change.

Fixed Capital Committee:

A continuation of the study of undistributed construction costs and fixed capital ledgers.

Recommendation as to what items of fixed capital may be considered as a unit for purposes of distinguishing between maintenance and depreciation.

General Records Committee:

Preservation and destruction of records.

Recommendation of a definite period of preservation for each accounting form used in the gas industry.

Recommendation of a routine for member companies for carrying on a systematic destruction of obsolete and duplicate records.

Filing systems and document rooms for the preservation of records.

Purchasing and Storekeeping Committee:

Subjects to be announced later.

Statistics Committee:

Cooperate with the Statistical Committee of the American Gas Association in obtaining statistics pertaining to the gas industry for Pacific Coast states.

Continuation of the study of operating reports and graphic charts and cooperate with the Distribution Committee of the Technical Section in connection with this study.

Collect and prepare statistics for other sections of the Pacific Coast Gas Association as required.

Special Committees:

Franchise Tax Committee—Confidential report to Executive Committee.

(Continued on Page 27)

EDITORIAL

An Executive A.G.A. Conference on the Pacific Coast

ANNOUNCEMENT has come officially from American Gas Association headquarters that the Advisory Council and Executive Board of the A. G. A. have accepted the invitation extended them by the Pacific Coast Gas Association through its president, C. H. Dickey, to hold an executive conference on the Pacific Coast. The conference is dated for the first week in February, to take place in Los Angeles.

Three years ago, in 1925, a similar conference was held on the Pacific Coast, and the decision to repeat the event will be welcome to Coast companies. These conferences bring A. G. A. enterprises more intimately to the attention of Coast executives than would be possible in any other way, and at the same time give the national association heads an insight into local problems.

There is a tendency to over-emphasize those special problems which differentiate gas service conditions in one section of the country from those in other sections. Conferences of the type in prospect for February bring out the more important truth that the industry's aims are identical at all points, and that in the main the methods followed to achieve the common purpose are far more similar than dissimilar.

Join the Modernization Movement

GAS companies are offered an ideal opportunity to build load on their present lines, and at the same time do something toward getting obsolete and inefficient appliances off their mains, by joining the ranks of the home modernizers. In the abstract everyone agrees that home modernization is a good thing, but only recently has anything concrete been done to promote a general appreciation of the fact.

Logically enough, the building interests of the country, which have most to gain from home modernization, have organized to get this message across to the public. The Home Modernizing Bureau of the National Building Industries, formed some time past by 131 executives of associations and corporations representing all factors involved in and allied with building enterprise, has set up a program under which local modernizing campaigns may be conducted in towns and cities, and throughout the country builders are launching these campaigns in many communities. Their immediate objectives are more construction work, more building labor employment, increased sale of building materials. To gain these ends they bring a sound argument to the homeowner. Modernization, they say, will enhance property values held down by obsolete structures; modernization will enrich the living surroundings of those who participate in such a campaign. In this way the builder and building materials dealer go about it to tap the estimated modernization market, made up of some 15,000,000 homes out of the country's 26,000,000.

The gas company can join hands with the builder and encourage the conducting of these local modernization efforts throughout its territory. During such a campaign it should follow up all local modernizing work with concentrated appliance selling while the home owner is in the right mood. There are heating plants to be installed, worn out appliances to be replaced with new. And in the course of such sales work the company can see that sufficient gas outlets are provided in homes which are being brought up to date in other respects.

It would be hard to imagine a better opportunity to check the dwindling domestic load than is offered in furthering home modernization—provided that the gas company commercial department is prepared to demonstrate, as it can, that its wares are the last word in modern convenience.

Keeping Up with New Products

A SECTION of the current issue of *Western Gas* is given over to new and improved equipment and appliances introduced by manufacturers of the industry during the present year. This is offered in the expectation that readers will find interest and value in reviewing what is being done to keep the industry mechanically abreast of the times. The criticism which has been leveled at gas equipment manufacturers in the past has been that they cling to traditional devices and seek the new only when electrical or other competition forces them. In part the fault is that of the gas company which through faulty commercial policy or organization fails to take up modern appliances and make it possible for the manufacturer to carry on. Through such agencies as the new equipment department in this number of *Western Gas* the gas company reader may follow appliance developments and plan to make early use of new and improved products. This is the only practical form of encouragement to manufacturers.

Accounting Section

(Continued from Page 25)

PERSONNEL AT NOVEMBER 30, 1928

Executive Committee

B. H. Parkinson (Chairman), Statistician, Portland Gas & Coke Company.
D. G. Martin, Vice-Chairman, Auditor, Pacific Gas and Electric Company.
E. H. Adams, Comptroller, British Columbia Electric Railway Co., Ltd.
C. A. Hulse, Treasurer and Asst. Secretary, Central Arizona Light & Power Company.
R. W. Maxwell, Auditor, Eastern Oregon Light & Power Company.
W. E. Houghton, Vice-President and Treasurer, Los Angeles Gas & Electric Corp.
E. W. Hodges, Comptroller, Pacific Gas and Electric Company.
M. B. Fowler, Secretary and Treasurer, San Diego Consolidated Gas & Electric Company.
A. E. Peat, Treasurer and Comptroller, Southern California Gas Company.
C. W. Platt, Secretary and Treasurer, Pacific Power & Light Company.
M. W. Thernes, Secretary, Spokane Gas & Fuel Company.
Walter S. McFarland, Secretary, Southern Counties Gas Company.
Herbert Painter, Asst. Secretary and Asst. Treas., The Tucson Gas, Electric Light & Power Co.
Aloys Knaff, Burroughs Adding Machine Company, Los Angeles, California.
A. J. Johnstone, Auditor, Portland Electric Power Company.
E. R. Wilcox, Sales Promotion Manager, Pacific Manifolding Book Company, Emeryville, California.

Customers' Records Committee

F. L. Nagel (Chairman), Portland Gas & Coke Company.
C. R. Johnson, Portland Gas & Coke Company.
Theodore Hoag, Spokane Gas & Fuel Company.
O. L. Moore, Los Angeles Gas & Electric Corp.
William E. Cook, Credit Manager, Spokane Gas & Fuel Company.
C. T. Krymer, San Diego Consolidated Gas & Electric Company.
J. W. Malone, Chief Clerk, British Columbia Electric Railway Co., Ltd.

Classification of Accounts Committee

M. J. Wilkinson (Chairman), Assistant Treasurer, Portland Gas & Coke Company.
E. N. Simmons, Vice-Chairman (Directing activities in the state of California), Los Angeles Gas & Electric Corp.
C. S. Hall, San Diego Consolidated Gas & Electric Company.
S. A. Horner, Accountant, British Columbia Electric Railway Co., Ltd.

Fixed Capital Committee

R. A. Hornby, Chairman, Valuation Engineer, Southern California Gas Company.
Marshall Shaw, Cost Accountant, Portland Gas & Coke Company.
M. W. Thernes, Secretary, Spokane Gas & Fuel Company.
C. D. Cushman, Los Angeles Gas & Electric Corp.
J. M. Bourus, San Diego Consolidated Gas & Electric Company.
S. A. Horner, Accountant, British Columbia Electric Railway Co., Ltd.

General Records Committee

A. T. Kelly, Chairman, Pacific Gas and Electric Company.
F. L. Nagel (Chairman), Portland Gas & Coke Coke Company.
N. H. Bradshaw, Los Angeles Gas & Electric Corp.
C. C. May, San Diego Consolidated Gas & Electric Company.
S. A. Horner, Accountant, British Columbia Electric Railway Co., Ltd.

Purchasing and Storeroom Committee

E. C. Cox, Chairman, Southern Counties Gas Company.
J. L. Rometch, Spokane Gas & Fuel Company.
Wm. Maddock, Los Angeles Gas & Electric Corp.
George N. Riblet, San Diego Consolidated Gas & Electric Company.
S. A. Horner, Accountant, British Columbia Electric Railway Co., Ltd.

Statistics Committee

W. C. F. West, Chairman, Statistician, Los Angeles Gas & Electric Corp.
C. E. Neiderer, Portland Gas & Coke Company.
Ben Hoke, Assistant Secretary, Spokane Gas & Fuel Company.
P. A. Bailey, San Diego, Consolidated Gas & Electric Company.
S. A. Horner, Accountant, British Columbia Railway Co., Ltd.

Public Relations Section

A. E. HOLLOWAY, *General Chairman*
E. G. MCCANN, *Vice-Chairman*
GEO. L. MYERS, *Vice-Chairman*

AT the meeting held at the Fairmount Hotel in San Francisco on Friday, November 23d it was decided to handle the work of the Public Relations Section under five committees, namely:

1. Committee on Relations with public.
2. Committee on Employees Relations.
3. Women's Committee
4. Publicity Committee.
5. Reports Committee.

Don C. Ray of the Pacific Gas and Electric Company, San Francisco, is appointed chairman of the Relations with Public Committee. This committee's will be handled under three sub-committees:

1. Relations with Public through Service.
2. Relations with Public through Personnel.
3. Relations with Public through Executive Policy.

George L. Myers, Pacific Power and Light Company, Portland, Oregon, is appointed chairman of the Committee on Reports. The work of this committee will fall under two sub-committees:

1. Legislation and Taxation.
2. Customer Ownership.

D. L. Scott of the Los Angeles Gas and Electric Company is appointed chairman of the Publicity Committee. The work of this committee is being grouped under two sub-heads:

1. Good-Will and Customer Ownership Advertising Exhibits.
2. Statistical Information.

E. G. McCann of the Pacific Gas and Electric Company is appointed chairman of the Public Relations Committee. This committee work is to be handled by three sub-committees:

1. Essay Contest Committee.
2. Stunts Night Contest Committee.
3. Public Speaking Contest Committee for Men.

Mrs. Ruth E. Creveling of the San Diego Consolidated Gas and Electric Company is appointed chairman of the Women's Committee. This committee will include the efforts of three sub-committees:

1. Public Speaking Contest for Women.
2. Women's Committee Organization Work.
3. Essay Contest.

The five chairmen named for these five committees will appoint chairmen of their various sub-committees in the very near future so that the work can progress as rapidly as possible.

The organization this year contemplates the distribution of the work among as great a number as possible in order to get a variety of ideas on the subjects discussed.

Executive Committee

W. C. Hornberger, Arizona Edison Co.
James Lightbody, British Columbia Electric Power & Gas Co.
C. T. Yates, Central Arizona Light & Power Co.
M. F. Wales, Coast Counties Gas & Electric Co.
F. A. Cressey, Jr., Modesto Gas Co.
C. M. Brewer, Mountain States Power Co.
Don C. Ray, Pacific Gas and Electric Co.
W. H. Barton, Portland Gas & Coke Co.
L. H. Stratford, Pocatello Gas & Power Co.
W. M. Hamilton, Portland Electric Power Co.
Harry B. Sewall, Puget Sound Power & Light Co.
A. M. Frost, San Joaquin Light & Power Corp.
F. H. Holden, Southern Calif. Gas Co.
F. H. Bivens, Southern Counties Gas Co.
Geo. A. Campbell, Sierra Pacific Power Co.
A. A. Caldwell, Turlock Gas Co.
C. Y. Bowers, Washington Gas & Electric Co.
D. L. Scott, Los Angeles Gas & Electric Corp.
G. L. Myers, Pacific Power & Light Co.

Technical Section

VAN E. BRITTON, *General Chairman*
B. G. WILLIAMS, *Vice-Chairman*
JOHN KEILLOR, *Vice-Chairman*

FOLLOWING the quarterly meeting of the Technical Section at San Francisco, November 22 and 23, the organization of the General Production Committee and the General Distribution Committee stands as below. Membership of the sub-committees is in the last stages of completion and will be published in next month's issue.

Representatives of Class A and Class B Association members compose the Executive Committee.

GENERAL PRODUCTION COMMITTEE

J. E. Kelley, Chairman, Pacific Gas and Electric Company.
W. A. Bahr, Pacific Gas and Electric Co.
C. M. Cole, Southern California Gas Co.
O. L. Dickinson, Pacific Gas and Electric Co.
W. H. Dreaper, British Columbia Electric Power & Gas Co.
J. J. Ferrari Puget Sound Power & Light Co.
L. A. Fulton, Pacific Gas and Electric Co.
A. E. Englebright, Pacific Gas and Electric Co.
A. E. Hall, Coast Counties Gas & Electric Co.
J. A. Harritt, San Diego Consolidated Gas & Electric Co.
R. H. Hargreaves, Pacific Gas and Electric Co.
F. C. Hawks, Washington Gas & Electric Co.
L. B. Jones, San Francisco.
J. T. Leary, Pacific Gas and Electric Co.
T. N. Kellett, Los Angeles Gas & Electric Corp.
D. J. McCarthy, Pacific Gas and Electric Co.
Roy T. Richards, Central Arizona Light & Power Co.
J. A. Riggs, Modesto Gas Co.
R. R. Ripley, Portland Gas & Coke Co.
Ted Rosebaugh, Pacific Gas and Electric Co.
J. F. Sauer, Pacific Gas and Electric Co.
R. F. Smith, Arizona Edison Co.
J. T. Sullivan, Sierra Pacific Power Co.
Frank Wills, Pacific Gas and Electric Co.

GENERAL DISTRIBUTION COMMITTEE

W. M. Henderson, Chairman, Los Angeles Gas and Electric Corp.
Robert Carver, British Columbia Electric Power and Gas Co.
R. S. Fuller, Pacific Gas and Electric Co.
W. F. Pape, Pacific Gas and Electric Co.
E. T. Floyd, Pacific Gas and Electric Co.
W. H. McLean, Pacific Gas and Electric Co.
D. B. Larson, Portland Gas & Coke Co.
D. H. Perkins, San Diego Consolidated Gas and Electric Co.
W. F. Tyler, San Joaquin Light & Power Corp.
J. J. Ferrari, Puget Sound Power & Light Co.
C. H. Webber, Tucson Gas, Electric Light and Power Co.
E. A. Angeley, Utah Gas and Coke Co.
Lee Holtz, Southern California Gas Co.
Geo. Wehrle, Public Service Co. of Colorado.
J. T. Sullivan, Sierra Pacific Power Co.

With *the* Metermen

Meter Session *at* Long Beach, Nov. 22

THE papers were on the program of the Southern California Meter Association monthly meeting at the Club California Casa Real, Long Beach, Calif., November 22. E. H. Pann and J. C. Read of the Pan American Petroleum Corporation collaborated in a paper on "The Effect of Irregularities in Orifice Plates on Gas Measurement," read by Mr. Read. A second paper, on "Paper Making as Applied to Gas Measurement," was prepared by S. R. Coleman of Kellow & Brown, and was read by Mr. Pann, chairman of the Association't program committee, in the absence of the author. Discussion followed each of the papers, the first of which appears in this issue of *Western Gas*. Mr. Coleman's paper will be published in the January number.

The Association's new project for monthly inspection trips through southern California industrial plants got away to a good start on October 27, when H. E. Thompson conducted a party of about 16 members through the Los Angeles Gas and Electric Corporation's Seal Beach steam plant. President Laulhere announced that another tour is in prospect, possibly for early in December.

Announcement was made that the Association Hi-Jinks will be scheduled for some time after the first of the year, probably in February.

Nineteen men turned out for the November 18th Association golf event, a monthly affair which is gaining increasing interest. C. E. Pickup and H. C. Woods split the first prize money between them in the "Blind Bogey" tournament, second place going to A. G. Lindell. President "Ben" Laulhere was the recipient of a surprise token presented at the November 22 meeting by T. K. M. Smith, on the occasion of his making one hole in par at the last monthly golf fray. The next golf date is December 16.

H. S. Bean of the Bureau of Standards, now in Southern California on Bureau work, has consented to address the December meeting of the Southern California Meter Association on the general subject of compressibility of gases. Mr. Bean will also discuss questions submitted by members on such themes as pulsation, straightening vanes, orifice plates, etc., from a broad background of personal experimentation in this field.

L. Bonner of the Standard Gasoline Company will also read a paper giving the results of a series of experiments conducted by the author on losses encountered in the measurement of large and small volumes of gas by orifice meter.

ARIZONA UTILITIES WILL MEET APRIL 18-20, 1929

The annual convention of the Arizona Utilities Association will be held in Tucson, Arizona, April 18, 19 and 20, 1929. Headquarters for the convention will be El Conquistador Hotel, according to L. C. McCullough, secretary of the Association.

Effect *of* Inaccuracies *in* Orifice Plates *Upon* Gas Measurement

By E. H. PANN *and* J. C. READ

*Pan American Petroleum Corporation**

FIGURATIVELY speaking the entire industry of gasoline manufacture from natural gas may be likened to a mushroom that has grown overnight. With its development, naturally, came many devices for facilitating natural gasoline manufacture. There came, too, a greater realizatioon of the value of natural gas and an effort was made to conserve this natural resource that had heretofore been wasted.

It was less than two decades ago, 1911, that the first orifice meter for gas measurement was put into service. Since that time, through constant experimentation with varying conditions and types of meters, gas measurement has proceeded to its present status.

The problem of measuring large quantities of gas has been simplified greatly since those first attempts, but even yet perplexing enigmas arise at every turn to show that the problem is not yet solved. There are surprisingly few books written on this topic, and what meager material there is must be sought in the depths of magazine covers. Very naturally the chief problem has been the devising of some suitable recorder, and towards this end most of the work has pointed. Little has been done to show the effect on the differential reading when the orifice plate itself is thrown under adverse conditions.

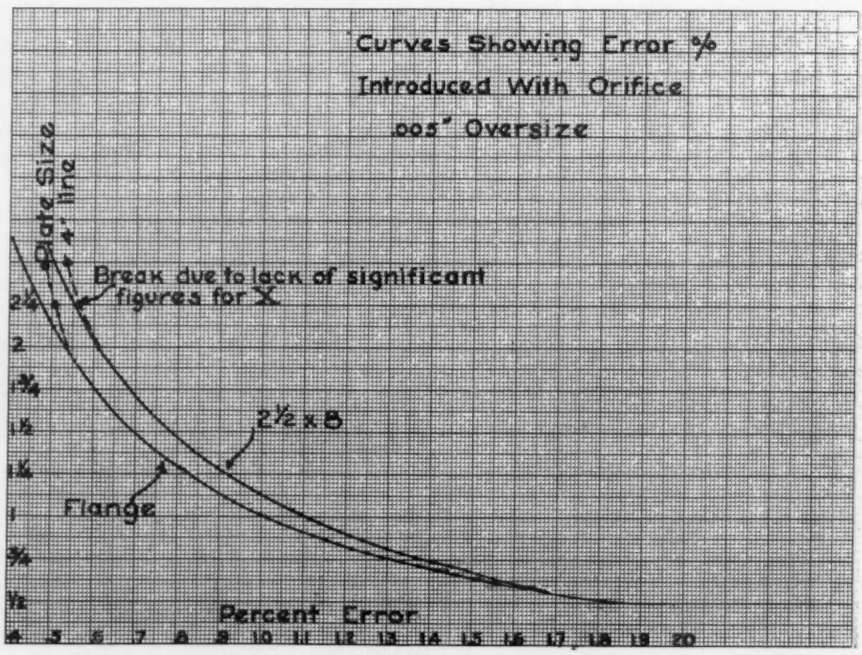
The orifice meter being considered dependable as a recording device, the gas engineer now seeks refinements of measurement in an endeavor to reduce the "unaccounted for" loss to a minimum.

Essentially this measurement depends on a pipe of known bore and length containing a means of holding an orifice which creates a pressure drop, together with the recording device for measuring the line pressure and pressure drop. Calculations for the gas flow are dependent upon the size pipe, orifice, and the location at which the pressure taps are placed with respect to the orifice. With this in view, coefficients may be calculated, a standard condition having been fixed for location of open flow and flange connections.

The open flow connections were established at 2½ and 8 diameters merely because it was found through experiment that takeoffs so placed gave a smaller pressure drop than at any closer point to the orifice. There can be but little doubt but that the inserting of an orifice in a line will cause eddies and while these eddies might not result in inaccuracies, the distant takeoffs eliminate this to an extent. Similarly, any takeoffs may be adopted provided new coefficients are figured to correspond to the changed conditions.

The entire procedure is based upon effects of pressure drop and pressure recovery. Should conditions be encountered in

*Delivered before the Southern California Meter Association, November 22, 1928, at Long Beach, California.



the measurement, other than those under which the efficiency or C_v curve was derived, the pressure drop and pressure recovery is not applicable, and an erroneous measurement results. Even to the present time no set standard has been adopted by the industry for a particular type orifice plate. The first type was bevelled to a sharp edge, but due to velocity of sand particles and erosion the sharp edge soon became saw tooth in effect, and the orifice became ineffective for measurement. The sharp edge was then widened to various thicknesses, the bevel being retained. Later the preference seemed to tend toward the straight sharp edge plate without any bevel and the throat ⅛ inch in thickness. The latter type plate will hereafter be referred to as standard in comparing the orifice plates run in the following described tests.

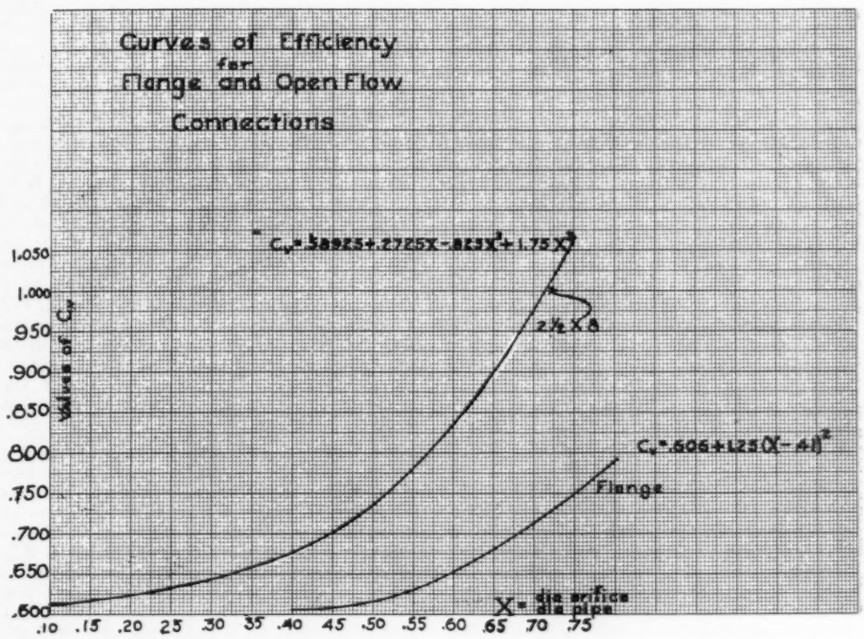
This report attempts to show some of the effects which are daily encountered in field practice, by irregularities or departures from normal conditions in the use of the orifice plate.

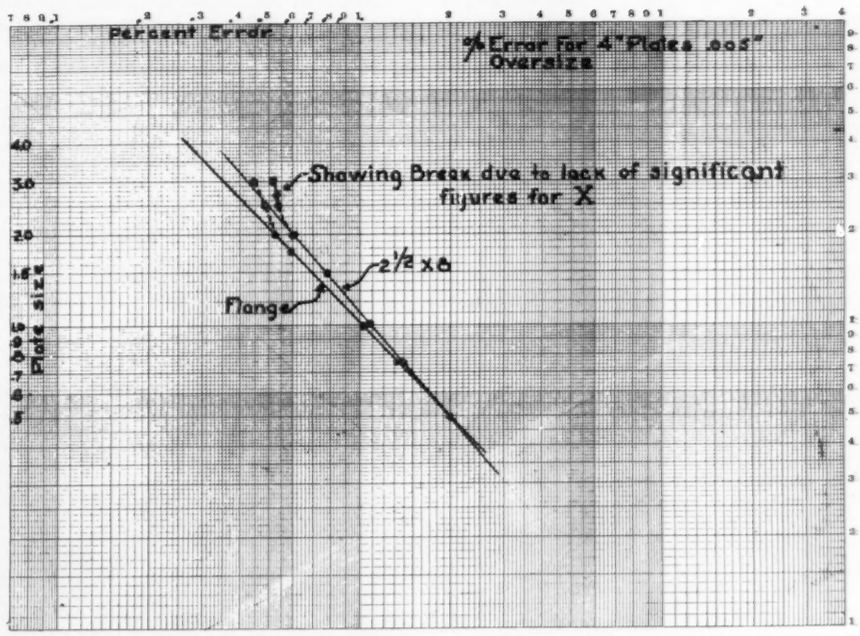
SETUP FOR TESTS

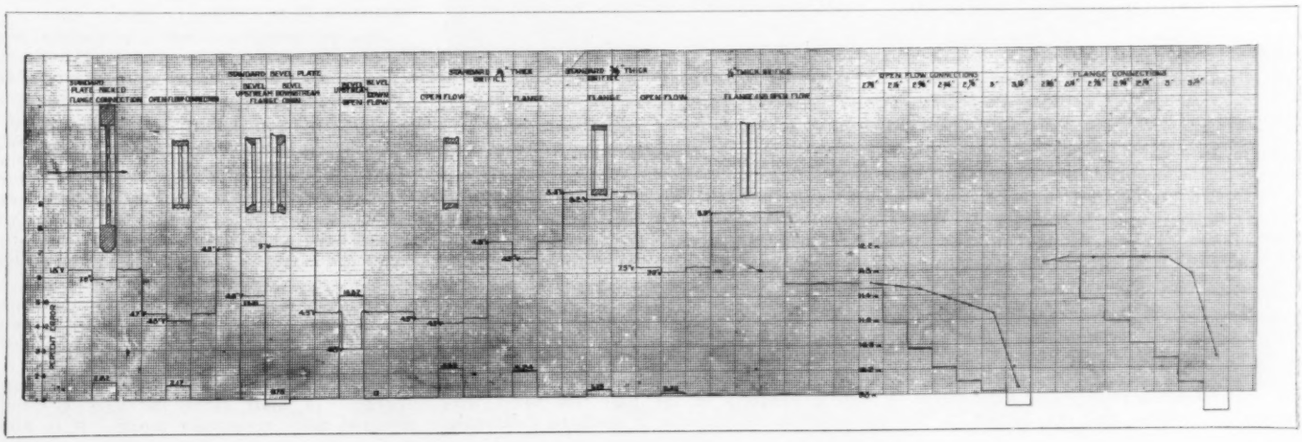
The setup for the experimentation on which this report is based, consisted of a selected joint of 4-inch standard pipe on each side of a Robinson Fitting, and an Anubis 10-inch range differential pressure recording gauge. Standard open flow and flange connections were made to the recorder.

Because of its unusually steady flow, a well in the Alamitos Field was chosen for the tests. The meter being on the vacuum side of a regulator, the pressure on the meter was regulated to a point where pulsation was minimum by means of a block valve in the line downstream. In all of these tests it must be remembered that this is merely but one of many conditions, and while not applicable to all it may be pointed out that all would tend in the same general direction.

The first test consisted of reproducing the case of an orifice plate that has been nicked by contact with some hard substance. It was noted that the effect was the same when the nicks were unstream as when downstream. With the flange connection an error of 2.82 per cent developed, and with the open flow 2.17 per cent. The error in each case was large, but the nicks put in the plate were exaggerated somewhat to illustrate the point. It would be impossible to point out any specific reason for the error incurred, except that burrs, dents and scratches upon the sharp edges of the plate, whether they be unstream or downstream, change the smooth straight line flow to irregular eddy currents to such extent that







true conditions are not met. This brings out the need for care of orifice plates, and emphasizes the fact that the edges must be sharp and true.

BEVEL AND STRAIGHT EDGE PLATES

The second condition was a comparison of bevel plate and a straight edged plate. The bevelled plate had an 1/8-inch edge, and a 1/4-inch bevel at 45 degrees. With the sharp side of the bevel plate upstream, no error was noted in the open flow, although with the flange there was possibly an error of 3/4 of one per cent. With the bevel upstream, the open flow connection showed an error of 16.6 per cent, and flange connections 15.3 per cent on a comparison with the standard plate. While this is truly an error which would be obtained under the present standard conditions, it must be understood that by a change of taps from those in use, to accommodate the change of pressure recovery, true results would be obtained. The bevel facing upstream causes the gas stream to funnel into the orifice, lessening the pressure loss through the orifice, and consequently giving a much lower differential.

The next series of tests undertaken was the determination of error due to various thickness of orifice. A test of the 5/8-inch thick orifice showed 4.36 per cent and 3.80 per cent on the open flow and flange connections respectively. Using a plate of 3/8-inch thickness, very little error appeared—0.49 per cent for open flow against 1.13 per cent for the flange connection. A 1/16-inch orifice apparently showed no visible error present when compared to the standard plate.

From these results it is seen that the thickness of the orifice affects the volume but little, and only when taken to extremes is the gas stream affected appreciably.

Lastly, in an endeavor to establish limits of orifice diameter to pipe diameter, as many plate sizes were tried as possible within the range of differential. The flange connection did not check the open flow connection, but the number of tests made were insufficient to establish any definite law. The plates as run showed a limit of 60 per cent with the open flow connections, and 72 per cent with flange connections. With the open flow connection the volume dropped away from orifice sizes 2 3/8 inches to 3 inches, and practically disappeared at 3 1/4 inches. The flange connection gave a much steadier curve, and gave constant volumes up to 2 7/8 inches when it started dropping off and fell away with a great error to 3 1/4 inches. The general law gathered here is to a void the use of large C_v values.

By calculations from the gas coefficient formula, the error due to over- or undersized plates may be obtained and their results plotted. Calculating with X values to three places, the resulting curve breaks sharply above a 2-inch orifice. This is due to inaccuracy introduced by limiting X to three significant figures. This inaccuracy is removed by plotting results on full logarithmic paper, and extending the straight line beyond the 2-inch point. By using this method with two orifice corrections for each oversize, lines for all orifice sizes in that same size pipe will be established.

Many other errors are introduced into measurement besides those shown. This paper does not cover them by any means, but it is hoped that the results shown may stimulate interest and further examination, looking toward the ultimate of perfect gas measurement.

Analyzing *the* Domestic Trend

(Continued from Page 21)

Water Heating—a Real Opportunity for Load Building: A survey of the water heating field revealed the following distribution of appliances:

Automatic water heaters	22%
Non-automatic water heaters	58%
No water heaters	20%

Automatic hot water service offers one of the most valuable load building opportunities. The field of automatic water heating in the majority of our territory is practically free from competition. Our only competitor is the water back which can hardly be classed as a serious obstacle to the sale of automatic water heaters on the Pacific Coast. We are our own competitors in that we permit a large volume of tank water heaters to be sold.

The automatic water heater is the outstanding appliance in the gas appliance field today. The volume of automatic water heaters sold each year is growing and with improved types of heaters at low cost automatic water heating service is available to everyone. In the automatic water heater we have an appliance which is worthy of our best sales effort—it not only serves as an excellent load builder but performs a real service for the gas consuming public.

A portion of that group of our consumers which use no gas water heaters, use gas for water heating purposes to some extent by means of boilers and tea kettles on their cooking stoves. A majority of them, however, depend on water backs in wood stoves or furnaces to heat their water.

Unfortunately some of our consumers who possess automatic storage water heaters are not using them as such, thus cutting down the revenue which might ordinarily be expected from these appliances. In most cases where consumers are not taking advantage of their automatic storage water heater we find that an inferior type of water heater has been sold and the owner has ceased its use because of unsatisfactory operation of the heater or because of excessive bills through inadequate insulation. Gas companies and dealers who continue to sell cheap, inferior types of automatic water heaters are not building permanent automatic water heating load.

Gas Heating Only Started: The gas heating field is as yet barely touched. Although a great number of consumers use gas for auxiliary heating purposes, only a very small percentage, approximately 12 per cent, use gas for a major source of heat. On the Pacific Coast there are more gas-fired, warm air heating systems than in all the rest of the United States. It might be assumed therefore that the gas heating business has at least been pioneered in this section. We find, however, that gas heating has made little progress in the past few years with the exception perhaps, of southern California.

It might appear from these figures on the saturation of the appliance field that conditions are very bad. The gas industry is fortunate however, in spite of this condition, because of the fact that unlimited opportunities are offered for load building through the sale of appliances in the vast unsold appliance field. It only remains for us to take advantage of this opportunity and the question of consumption per consumer will be forever solved.

D. Effect of Habits of Living on Gas Consumption.

Intangible competition brought about through the change in our habits of living is probably one of the most important factors tending to decrease our consumption per consumer. The question as to whether or not we can do anything to successfully combat these economic forces is debatable. It is a known fact, however, that our habits of living are to some extent controlled by advertising and the effect of certain types of advertising is to create an unnatural condition or a condition brought into popular favor merely because of stronger advertsing, in order to sell more of a certain product.

Unnatural conditions created as a result of such advertising can be successfully combated by the gas industry through properly planned and executed sales and advertising work.

Commercial Laundries: As an example of advertising which might tend to create an unnatural economic condition we might cite the national avertising program of the Laundrymen's Association. Many of our consumers who formerly did their own washing at home are patronizing the commercial laundries. This practice of course is a detriment to our water heating load and has resulted in a considerable loss in revenue.

There are many reasons why laundry should be done in the home but the powerful advertising of the Laundryman's Association is apt to continue to cause people to patronize the commercial laundries, thereby nullifying the many strong points in favor of doing laundry work in the home.

The only solution to successful competition with economic changes brought about through natural causes is to seek new markets for gas as a fuel. This does not mean that we must seek an entirely new field for the application of gas since there are many opportunities for increasing the gas load of our existing consumers as indicated by the precedng data on the saturation of the appliance field.

Restaurants: Statistics gathered by the Chambers of Commerce of the United States on five typical cities indicate that the percentage of meals eaten in restaurants averages over 20 per cent.

This percentage varies considerably between the eastern cities and Pacific Coast cities. For example—in Baltimore and Atlanta the average percenta of meals taken in restaurants is about 12 per cent while in Denver and Seattle the number of meals taken in restaurants exceeds 20 per cent. This differential might be accounted for through the fact that the Pacific Coast has a considerably larger tourist business than the Eastern Coast, resulting in more transient visitors who would take their meals in hotels and restaurants.

The restaurant and delicatessen business has a definite bearing on gas consumption in the home through the sale of ready-cooked meals which might have been cooked at home. The growth of middle class restaurants in most cities indicates a trend towards more restaurant meals. It is also

a fact, however, that home service work is being popularized by newspapers and other agencies which would indicate that there is also a counter movement towards interest in home cooked meals.

Diets: Today's fashion calls for a slender figure for those who would be properly dressed. This of course is particularly true of women and some men have taken up the cause. This tendency brings about the adoption of diets which, in many cases, require little or no cooking.

Most mid-day lunches are now composed of light salads and sandwiches as a substitute for the old-fashioned so called "heavy" meal. This practice naturally tends to reduce our cooking revenue.

Housing Habits: One of the biggest bugaboos to increased gas consumption in cities has been the apartment house dwelling. Figures compiled by the United States Department of Labor indicate a rapid trend towards apartment house construction:

	1921	1927
	Per cent	Per cent
Single family dwellings	58.3	38.3
Two-family dwellings	17.3	13.4
Apartments	24.4	48.3
	100.0	100.0
	Per cent	Per cent

The single family dwelling and the two family dwelling are both good gas consumers if sold the proper appliances. The present apartment dwelling, at its best, is a poor consumer.

The greatest increase in apartment house dwellings is in the northern cities such as Portland, Seattle and San Francisco. In San Francisco, for example, a recent survey by the Chamber of Commerce has shown that there are 110.000 apartment buildings with only 79,000 individual family dwellings. The city of San Francisco probably shows a greater percentage of apartments than most cities on the Pacific Coast. Gas companies serving large cities are confronted with the problem of increasing consumption in the face of such unfavorable conditions. Even though it were possible to increase the gas consumption per consumer to a reasonable amount, in single family dwellings, the territory as as a whole would show a very low consumption per consumer if apartment house dwellings were included in the consumer count.

Aside from the fact that apartment house dwellings are small gas users we find that the gas consumption per customer in apartment houses is gradually decreasing. The following figures indicate this trend: (San Francisco apartments).

1924	12,900 cubic feet per year
1925	11,736 cubic feet per year
1926	10,272 cubic feet per year
1927	9,492 cubic feet per year

In other words, apartment house dwellings are in the "less than 1000 subic foot class" and therefore fall in the class of unprofitable consumers.

Apartment house dwellers are the best customers for delicatessen stores, restaurants and commercial laundries—the existence of apartment-houses also results in a decrease in gas consumption from those sources.

The reason for increased apartment house construction is attributed to the fact that modern household conveniences such as the radio, hot water, heating, janitor service, etc., can be secured at a lower cost than in individual family dwellings.

There is no doubt but what some additional load can be secured from the apartment house through more aggressive selling activity on the part of gas companies in this particular field. What would be more convenient in an apartment house, for example, than individual gas-fired clothes dryers for each apartment, thus eliminating the necessity of using clothes lines on the roof.

The room heating and water heating loads have been given up to the oil industry and the only source of revenue that remains is through gas used for cooking purposes and even this source is being jeopardized through the advance of electric cooking in the newer apartment house buildings.

In most of the territory on the Pacific Coast our present gas rates will not permit competition with oil on central-fired steam heating systems and water heating systems in apartment houses, but aggressive selling effort on quality cooking appliances will at least retain the cooking load.

The solution of the problem of obtaining the larger heating load appears to rest in a large extent in our rate-making departments. Whether or not rates can be reduced to a point which will make it possible to obtain this business at a profit is of course open to question.

Other Factors of Competition: In addition to the principal factors tending to decrease our consumption per consumer, which have already been outlined, we can not overlook the rapid increase in the use of prepared foods requiring little or no gas in preparation, nor the effect of radios and automobiles and other modern habits of living on our domestic gas load.

(Competitive appliance sales, and gas company sales policies, are discussed in the concluding portions of Mr. Brundige's discussion, which will appear in Western Gas for January, 1929.—*Editor.*)

All-Gas Kitchens *for* San Francisco's Newest Hotel

SAN FRANCISCO division sales force of the Pacific Gas and Electric Company, and especially I. L. Heckinger, hotel and restaurant salesman for the company, are receiving congratulations for the work on the part of that division in selling equipment for the installation of all-gas kitchens in the new Sir Francis Drake Hotel in San Francisco. The sale was considered more difficult owing to the fact that the management of the hotel was reported as favoring oil as a fuel, and the task of advancing the cause of gas was not an easy one.

Gas salesmen of San Francisco can point with pride to various recent commercial installations which will prove the contention that gas provides a cleaner, more flexible and cheaper type of heat for all purposes. The Palace Hotel, the Fairmont, the Plaza (but recently changed to gas), the Richlieu, the Granada and the Hotel Whitcomb Coffee Shop are all enthusiastic users of gas.

The Sir Francis Drake is a 600-room hotel, modern in every respect, with a large dining room, banquet rooms and a coffee shop. Located at Powell and Sutter in the heart of the business section of the city, the hotel attracts an especially heavy noonday trade from the surrounding offices. As an indispensable adjunct to the splendid service the hotel offers, a kitchen equipped with a battery of heavy duty Garland ranges gives a maximum of flexibility and cleanliness. Two large gas broilers are also installed for the preparation of steaks, chops and other foods that are better prepared over an open fire.

Each cook in charge of a range is his own engineer. He may use the top of his range, the oven, or both, with no loss of fuel. Asbestos insulation keeps the temperature in the kitchen lower, and finds favor with the chef and his corps of helpers. The chef-steward of the hotel, himself an advocate of gas-fired kitchens, is Julian Perbost, who established his early culinary reputation with the famous Maxime in Paris.

Battery of ranges in Sir Francis Drake Hotel kitchens

E. J. Stephany *is* Sec'y. *of* Nat. Gas. Dept., A. G. A.

APPOINTMENT of E. J. Stephany of Pittsburgh, as secretary of the Natural Gas Department of the American Gas Association was announced on November 12 by Oscar H. Fogg, president of the Association.

Mr. Stephany at the time of his appointment was assistant manager of sales and service of the Philadelphia company, with which he has served for the past ten years either at the headquarters or the office of the Equitable Gas Company, a subsidiary. He is also secretary of the Pennsylvania Natural Gas Men's Association, affiliated with the American Gas Association.

E. J. Stephany

Bringing a background of education and a well rounded experience in natural gas work, Mr. Stephany will be welcomed in his new office by all branches of the natural gas industry in the United States. He is 36 years old, and a graduate of the University of Wisconsin in the Mechanical Engineering class of 1913. After graduation he served as cadet engineer for a year and a half with the Western United Gas and Electric Company of Aurora, Illinois. In 1917 he joined others in the organization of the Southern Illinois Gas Company at Murphysboro, Illinois. Franchises were secured in seven towns. Mr. Stephany was commercial manager of this group. In 1918 he joined the staff of the Equitable Gas Company as industrial gas engineer, and for the past two years has been with the Philadelphia Company, parent organization of the Equitable Gas Company.

Oscar H. Fogg, president of the American Gas Association, Alexander Forward, managing director, and Samuel W. Meals, chairman of the Natural Gas Department of the Association, have expressed their gratification in the appointment of Mr. Stephany, who has given active service to the natural gas industry and to the American Gas Association over a period of years.

Hot-N-Cold Corp. Opens Seventh S. F. Store

THE seventh store in the chain of community Hot-N-Kold Shops, as a part of the Hot-N-Kold Corporation's Northern California merchandising progress, has been opened at 417 Sutter Street, San Francisco, under the management of W. R. Hendy.

This location, which is in the heart of San Francisco's new gas appliance retail district, has been tastefully decorated in modern style, and window and store displays of Welsbach water heaters, several standard makes of gas ranges, radiant type heaters and Payne gas furnaces are being shown. This company also handles Kelvinator refrigeration.

In addition to the seven retail shops, there are four established gas appliance dealers now operating under Hot-N-Kold franchises.

J. C. Douglas, vice-president of the corporation, reports that the fall heating season has been particularly profitable in sales and installations of the Payne furnace.

Legislation

(Continued from Page 19)

still further complicates the problems of finance when there are a number of franchises with different terms of tenure. The simple policy is for the permit to be granted by the state, with minor subdivisions of government dispossessed of none of their essential police powers. A franchise has become impotent for purposes of regulating charges and standards of service with the advent of state regulation. There remain for minor subdivisions of state government only the police powers to regulate the use of their public thoroughfares so that the convenience and safety of the public may not be impaired, and the right to demand compensation for their use. There is no longer need for a periodic grant of a franchise for purposes of regulation. Powers of regulation by the state are well nigh all inclusive and variable enough to meet changing conditions and needs.

Governmentally operated utilities should be subject to some measure of regulation by the state. There is economic justification for as full an exercise of regulation as in the case of privately operated utilities if the service is to be rendered without discrimination and with fairness to the taxpayer. The minimum of regulation should be conformity by governmentally operated utilities with the requirements for privately operated utilities in their compliance with uniform classifications of accounts and periodical and annual reports, and safety standards of operation and construction. Then it will be possible to obtain facts impartially about government operation and deal fairly with the taxpayer. It is possible only through disinterested regulation to determine the real facts about the success or failure of such operations. If the governmentally operated utility has nothing it seeks to withhold from public knowledge it cannot object to at least this minimum of regulation. The privately operated utility has a right to advocate such regulation so that fair competition and fair comparisons may be reasonably assured. The taxpayer has a right to demand it so that he may be reasonably assured he does not pay with his tax dollar for the service of others. The citizen has a right to insist upon it so as to be reasonably assured that the politician cannot misrepresent the facts from selfish motives.

All property held or used for gainful purposes, whether those purposes be to profit by the sale of a service or a commodity or to supply either at cost with resultant profit to the user or consumer, should be subject to taxation in like manner as all other property. When government engages in any economic enterprise it acts in a proprietary capacity and not as a sovereign. Hence, the nature of the ownership does not make it tenable that discrimination may be practiced by exempting the property from taxation and imposing a necessarily greater burden of taxation on others engaged in a similar enterprise because the ownership of the property happens to be vested in private capital. Such a policy of government fosters unfair competition. Its effect is to subsidize the enterprise whose property stands tax exempt. It means that all taxable property, whether it be that of industry, commerce, agriculture or the home, must pay more in taxes so that those who are supplied by the enterprise whose property is tax exempt may pay less for the service or commodity. If such a policy is tolerated by the state then all taxable property outside the local jurisdiction of the exempted property must be taxed proportionately greater without any compensating benefit whasoever. Those who choose to be served by privately owned enterprises are penalized. Those who choose to be served by governmentally owner enterprises are favored. Such a policy of taxation is wholly without moral defense and economic justification.

Senior securities of public utilities should be made eligible for the investment of savings and trust funds. The fixed nature of the property of a public utility and the necessity for its service give it a stability both in property values and earnings which warrant such type of investment. Regulation, which presumes to insure at least a reasonable return upon the fair value of useful property, and freedom from competition in identical service, serves to increase the stability of the enterprise. Such securities thereby become more attractive, and, as a consequence, tend to decrease the cost of money to the utility, to increase the saleability by the investor, and to decrease the cost of service to the user. There is a trimutuality of benefit.

REPLACEMENT PROGRAM AT MEDFORD, ORE., UNDER WAY

Since its reorganization the Southern Oregon Gas Corporation has been increasing its holdings in Medford and the Rogue River Valley. An increasing number of consumers is occasioning a meter replacement program, new iron-case Sprague meters being installed in place of obsolete types, under the direction of F. A. Andrews, service manager.

R. L. AGASSIZ TO REMAIN HEAD OF RESEARCH ASSN.

At the eighth annual meeting of the Copper & Brass Research Association held on October 25 in the offices of the association, R. L. Agassiz, chairman of the Calumet and Hecla Consolidated Copper Company was re-elected president.

BOTFIELD CO. NAMES MARSHALL SUPPLY CO. DISTRIBUTOR

Botfield Refractories Company of Philadelphia, announces that the Marshall Supply Company, Incorporated, operating in Pittsburg, Kansas, and Tulsa, Oklahoma, has been appointed distributor for Botfield products in that territory.

THREE NEW COMPRESSOR UNITS BUILT BY SO. CAL. GAS CO.

Three additional compressor units have been installed at the Signal Hill No. 1 plant of the Southern California Gas Company for handling additional gas from the Long Beach field. The company's transmission system has been augmented by the construction of two miles of 12-inch pipe at the same location.

1928 Progress *in* Appliances *and* Equipment

Further information regarding new or improved apparatus described in this annual New Equipment Section may be had by addressing "Western Gas"

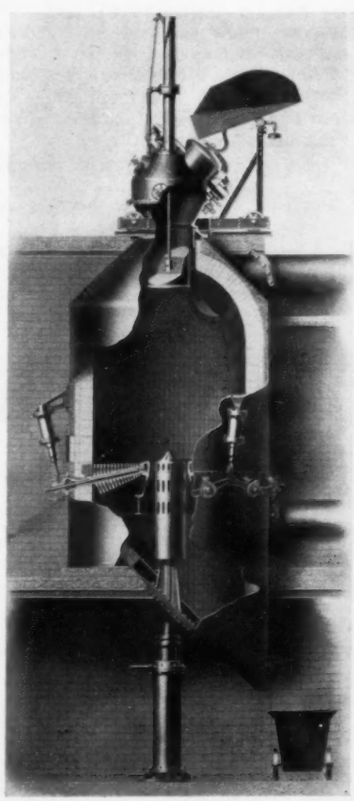
Steere Automatic Grate

THE Semet-Solvay Engineering Corporation has developed the Steere Automatic Grate, and incorporates it in the Steere Clinkering System, which employs it to remove clinker and ash from a water gas generator.

One of the accompanying illustrations shows the complete assembly of the Steere Water Gas Machine Generator, including Charging machine for refueling, poker and automatic rolling grate for clinkering and hopper type ash pit.

The Steere Automatic Grate is built of conical-shaped segments, varying in number and dimension according to the size of the generator in which they are installed. The discs which form each grate segment are octagon shaped. The segments are rotated by hydraulic cylinders, each of which will turn several segments. The cylinders derive their energy from the same hydraulic system that operates the machine. The working of the grate is controlled from the operating floor.

Rolling grate in Steere 10-inch machine



Steere Automatic Grate

The segments can be regulated to obtain desirable firing conditions. The length of the piston stroke can be controlled so that the grate segments will move one fiftieth of the circumference, or they can be completely turned over in eight piston strokes. The number of strokes of the piston in any given unit of time can also be fixed. Any one grate segment can be disconnected from the cylinder or the cylinder itself can be made inactive by the closing of a valve.

The arrangement of the ratchet connected to the driving shaft of each segment and of the pawl attached to the cylinder piston makes possible the rotation of segments. By fixing the position of the pawls, the grate segments can be revolved clockwise, counter-clockwise, all in one direction, or part in one direction and part in another. All control mechanism is accessible.

The revolving action of the grate is intermittent. Its hydraulic energy is obtained by connection to the piping that operates the blast or the run, which causes the cylinders to move the grate once on each cycle. It has been found most satisfactory to rotate alternating segments at each operation. This is arranged by adjustment of the pawls so that the alternating segments are moved on the up and down strokes of the cylinders respectively.

The Steere Automatic Grate and the Grate Poker combine for mechanical clinkering. The poker is located at the center of the grate. It rises vertically into the heart of the fuel bed. It breaks up clinker and crowds fuel against the side walls, where open passages are constantly being created by the combustion of the fuel, or, in the case of soft coal, by the tendency to shrink away from the side walls.

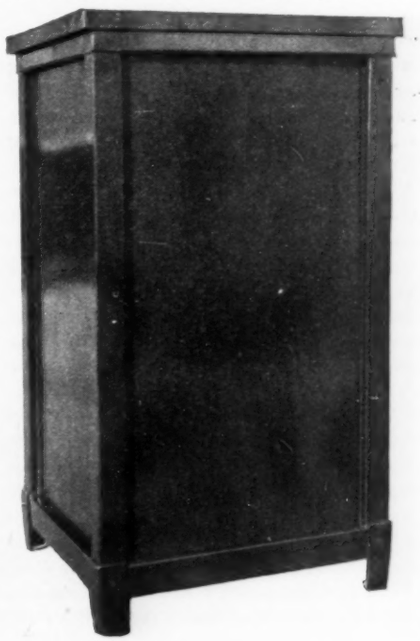
Clinker and ash are kept loosened by the poker. As the grate segments revolve they grind up the clinker and remove it from the generator into the ash pit.

The Steere Charging Machine places fuel at the side wall in a sector of the generator where needed, never successively in one spot except at the wish of the operator. Continuous automatic charging makes possible a uniform depth of fuel bed. The placing of each charge against the side walls keeps the fine coal at the outer edge.

The Steere Grate Poker is hydraulically operated. When not in use it is out of the generator, its tip on a level with the grate. The poker is raised whenever the fire develops blow holes or when clinker threatens to seal off the grate area, or when open passages develop between the fuel and the shell lining through which the blasts may travel. These conditions are revealed to the operator by his gauges. As the Grate Poker enters the fuel bed, it crowds partially burned fuel into the open spaces.

New Electrogas Models

A NEW model No. 2-A Electrogas Floor Furnace is announced by the Electrogas Furnace Company. This model is identical with the No. 2 unit in all respects except overall depth, it being 6 inches



deeper than the former, and having a 38 per cent greater radiating surface. Electrogas Floor Furnaces are now available in four sizes,—the original No. 1, the No. 2, the No. 2-A, and the No. 3.

This company has also developed a cabinet furnace, manufactured of furniture steel, with a hand grained and rubbed walnut finish. A standard No. 1 Electrogas is mounted within the cabinet, and so arranged as to draw cold air from the floor level. When used as a furance, the cabinet top is swung upward, or removed entirely, disclosing the standard Electrogas grille, or register, through which the hot air is delivered; by the use of concentric air columns, the sides of the cabinet remain cool. All products of combustion are vented out of doors. The electric lighting device, originated by this company, is utilized on the cabinet furnace.

Type R Nordstrom Valve

FOR the purpose of furnishing the industry with a valve especially for curb and meter service, Type R Valve was recently introduced by the Merco Nordstrom Valve Company. It is of the plug cock type

with lubricating and lifting features. It uses lubricant under pressure to release the plug against the sealing action of a spring disc and by the same operation this creates a small space into which a film of lubricant forces the plug from contact with its seat. A stick of lubricant is inserted in the reservoir and the lubricating screw turned down on it until the grease in the shank is distributed over the ground surfaces of the valve. The valve embodies the patented Sealdport type of lubricant, allowing the plug to be turned through 360° without allowing the line pressure to force the lubricant out of the valve.

The valve can be furnished with lock wings. Range of sizes is ¾ inch, 1 inch, 1¼ inch and 1½ inch. Equipped with iron bodies and brass plugs the valves are recommended for 100 pounds air or water pressure or 50 pounds gasoline or gas pressure. The manufacturer, Merco Nordstrom Valve Company, has just issued a new catalog describing the various Nordstrom Lubricated Valves.

Johnson Gas Appliance Co. Offers New Urn Burner

A NEW style urn burner, together with a new automatic thermostatic control are both a part of the 1928 offering of the Johnson Gas Appliance Company. The urn is designed so that it may be placed near the urn or steam table. The construction and adjustments of this burner embody the Johnson principles applied in former models, but is entirely new in design. The burner is equipped with the Venturi tube. Gas port holes are drilled around the side, which directs the heat out over the bottom of the urn. The burner head is 2½ inches in diameter and has a large opening in the center which provides secondary air. The adjustable air shutter permits adjustment of the air supply. The hood adjusting cap with direct jet regulator makes an adjustable gas orifice. The new thermostatic control is automatic, keeping the coffee or water just below the boiling point.

Improvements *in* Payne Unit Furnace

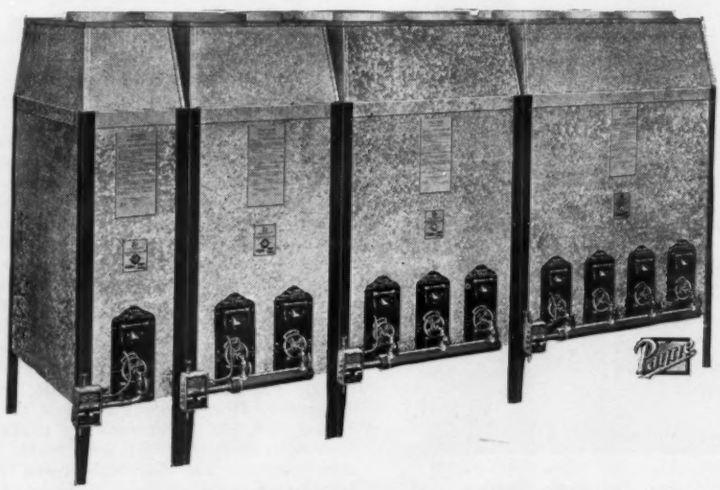
WHILE these has been no change in the basic principle of Payne Unit Furnace, manufactured by the Payne Furnace and Supply Company, there have been a number of constructural improvements made in firebox, burner, casing and assembly parts. These improvements are as follows:

Casing:

1. Air intake at bottom.
   Permits factory to standardize certain parts of casing.
2. Increased air chamber in bonnet.
   Permits temperatures of air to equalize before going into the pipes.
3. Detachable bonnet.
   Permits use of pitched bonnet or transition tops without disturbing main part of casing.
4. More space for air circulation between casing and heating element.
5. Different lock on corners of casing.
   Permits removal of any panel of casing to see heating element without disturbing rest of casing.
6. Legs extended to top of casing.
   Strengthen furnace, making casing more rigid.

Heating Element, Burners, etc.:

1. Radiator tubes back of firebox have been spaced further apart from left to right.
   Permits more air to circulate through the elements.
2. Crown sheet of firebox has been raised.
   Permits more combustion space.
3. Fireboxes are braced with channel irons.
   Prevents warping when heating and cooling.
4. Each section has individual burner, venturi, burner cock and door.
   Permits air in front of fire-box in cold air return type furnaces.



5. Lighting doors are much smaller and contain peep hole.
   Prevents thrusting hand inside to light and permits one to see if pilot or fire is burning properly without opening door.
6. Lower door for secondary air.
   Has positive adjustment which prevents shutting off secondary air for combustion.
7. Door frame is made in two parts.
   By removing upper half of door furnace may have humidifying pans installed.
8. Cast iron gas manifold.
   Distributes gas to each burner.
9. Burners are connected to venturi tube by male and female machined tapered joint.
   Burners may be installed and removed after upper half of door frame is taken off.

High Inertia Impeller

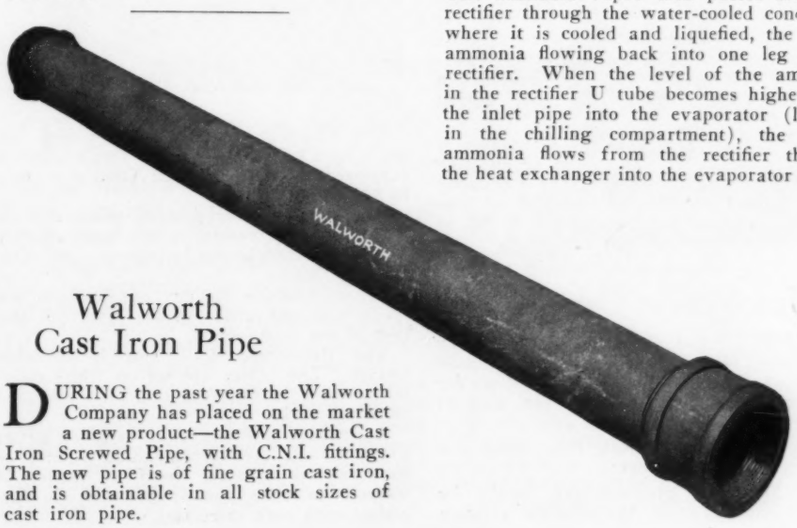
TWO new features of design which are being applied to Connersville Rotary Positive Blowers and Gas Pumps, manufactured by the Connersville Blower Company, are the high inertia impeller and the renewable sleeve bearing construction.

A new theory of design is incorporated in the impellers of the rotary blowers and gas pumps. In older types, there has been angular displacement of the impellers and torsional reactions of the shafts, caused by the variation in the pressure loads on the impellers at different points in the revolution. By increasing the weight of the impellers and by more exact balancing, these parts have been given a high inertia value or flywheel effect that reduces this angular distortion, permitting a reduction in the clearances between moving parts.

Due to the inertia value of these impellers, the working load is more evenly distributed over the entire circumference of the gears, rather than concentrated on a few teeth at opposite portions of the revolution.

Another added value in the blowers and gas pumps is the use of a renewable split sleeve ring-oiling bearing. It is made with a lining of babbitt in cast iron shell.

With this bearing the alignment of the shafts may be renewed. The shell is split along the horizontal center. By removing the cap, the top half of the bearing may be lifted off. Then the lower portion of the old bearing can be rolled from under the shaft, and a new section slipped into its place without removing gears. These bearings are interchangeable on machines of the same size.



Walworth Cast Iron Pipe

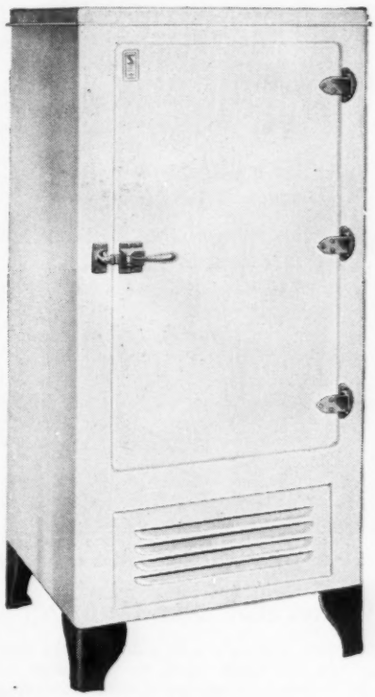
DURING the past year the Walworth Company has placed on the market a new product—the Walworth Cast Iron Screwed Pipe, with C.N.I. fittings. The new pipe is of fine grain cast iron, and is obtainable in all stock sizes of cast iron pipe.

New Electrolux Models

A NEW Electrolux Refrigerator, El-5B, placed on the market by the Electrolux-Servel Corporation embodies principles used in former models, being of the absorption type. It is a smaller model than previous ones and is designed for use where limited space prohibits the use of the larger types. This company also offers a new water cooler, and a new refrigerating unit for drug stores.

The operating principle of the Electrolux type of refrigeration is as follows:

The strong liquid (distilled water and ammonia slightly stronger than household ammonia) is heated by the gas flame in the



Electrolux Model El-5B

generator. The ammonia vaporizes and passes into the rectifier, where a constant temperature is maintained by the evaporation of ammonia from the previously liquefied ammonia in the bottom of the U tube. The ammonia vapor then passes from the rectifier through the water-cooled condenser, where it is cooled and liquefied, the liquid ammonia flowing back into one leg of the rectifier. When the level of the ammonia in the rectifier U tube becomes higher than the inlet pipe into the evaporator (located in the chilling compartment), the liquid ammonia flows from the rectifier through the heat exchanger into the evaporator where it evaporates and absorbs heat from the box.

A hydrogen gas atmosphere in the evaporator causes the ammonia to evaporate, maintaining a constant pressure in the system. As the ammonia evaporates into the hydrogen, the mixture, being heavier than the hydrogen itself, sinks to the bottom of the evaporator, passes through the gas heat exchanger and into the absorber.

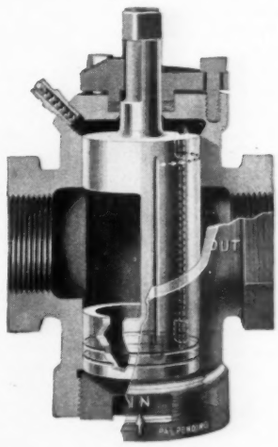
In the absorber the ammonia and hydrogen meet a stream of weak liquid which has been cooled in its passage from the generator. This liquid absorbs practically all the ammonia in the gas mixture. Heat is given off when ammonia dissolves in water so the absorber must be cooled The hydrogen being insoluble in water, and being lighter than the incoming mixture of ammonia and hydrogen, rises and flows again to the evaporator, which is at a slightly higher level than the absorber. The mixture of water and ammonia sinks in the absorber and passes by gravity back to the lower section of the generator. It is lifted from this point to the upper part by means of the thermo-syphon actuated by heat applied at this point. The heat supplied not only lifts the liquid from the lower level in the generator into the higher level of the generator, but also releases ammonia from the strong liquid to repeat its cycle of refrigeration.

MacGregor Rotary Valve

THE MacGregor Rotary Valve is a positive-sealing, self-lubricating, free-turning valve that embodies new applications of an old principle. It is built along the principles of the Corliss Engine Valve, with additions and modifications incorporated.

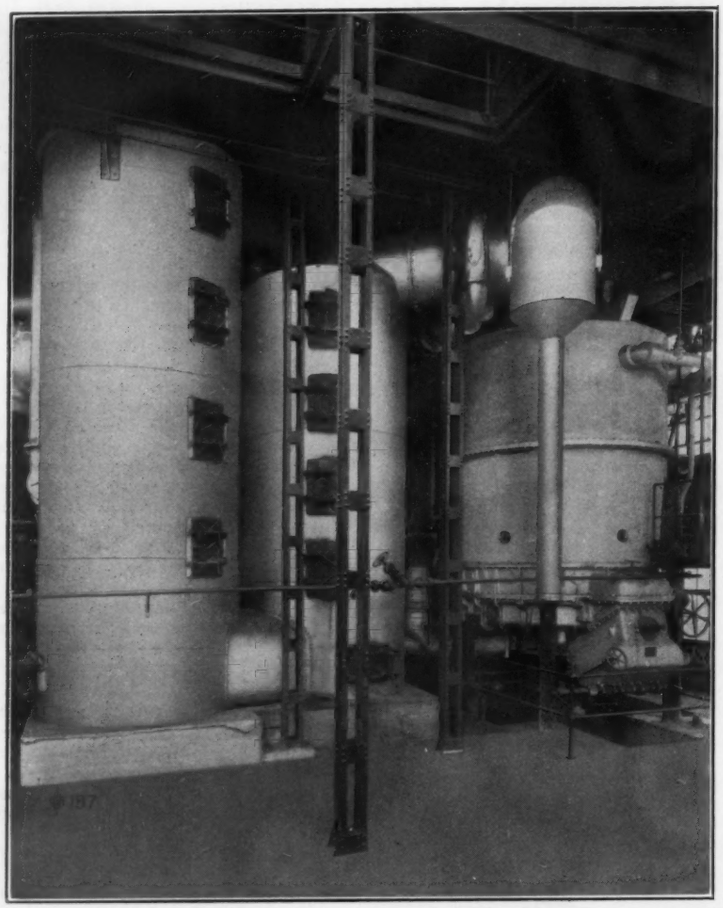
Some of the modifications are that the valve rotor can be turned with a wrench or handle, that the valve has both a bottom and side inlet, with interchangeable parts, and that the valve is automatic in its lubrication.

The design of the MacGregor Rotary Valve provides a reservoir between the top of the rotor and the top of the valve body,



into which the lubricant is injected. Then, as the applied pressure of the pipe line acts against the exposed ceiling of the rotor, it forces the rotor upward with a piston motion, compressing the lubricant in the reservoir.

Under this pressure, the lubricant is forced into two grooves cut lengwise in the rotor face and down into a groove cut around the base of the rotor. This action seals the outlet of the valve so that there can be no leakage.



U. G. I. Water Gas Machine equipped with mechanical generator and charger

The U. G. I. Mechanical Generator *and* Charger

THE U. G. I. Mechanical Generator and Charger is a self-clinkering water gas apparatus, developed from the Lowe Double Superheater Water Gas Apparatus by the United Engineers and Constructors, Inc. It is an automatically operated and controlled water gas generator.

The U. G. I. Mechanical Generator consists of a generator shell and mechanical grate. The generator shell ,which is supported on steel columns, embodies an annular water jacket surrounding the lower portion of the fuel bed, high enough to be above the otherwise clinker adhesion zone. The water jacket, with its steam drum, provides a low pressure boiler so that the heat conducted through the walls is recovered as low pressure steam for use as process steam in the water gas reaction. The portion of the generator above the water jacket and clinker adhesion zone is firebrick lined in the usual manner.

The grate is a development of the cone stepped grate type which reduces the thickness of the fuel bed at the center.

The grate through which the air and steam pass is rotated by a motor and reduction gearing outside the generator, the shaft from which drives the grate through a worm gearing. The bearing surface for the grate is supported by the housing, which is in turn supported by the generator columns. The rotation of the grate agitates the fuel bed, thus keeping it open, crushes any clinker which may be formed and delivers the crushed clinker and ashes to a plow by which they are directed into a side ash hopper.

There are two side ash hoppers for receiving the ashes from the ash plow. The ash hoppers are equipped with internal gates and bottom doors for use on elevated generators. Where the generator is not elevated, the ash hoppers are equipped with side doors through which ashes can be removed.

The mechanical generator is equipped with a U. G. I. Charger which charges fuel on every down run. This charger was developed by Humphreys & Glasgow in London. The charger has an inlet gate for filling and a bottom bell gate for charging, the two gates being mechanically interlocked. The bottom bell gate provides a spreader for spreading the fuel during charging.

The U. G. I. Mechanical Generator is available for either flat bottom or elevated 11 feet 0 inch sets, and will have a capacity of between 3,500 M. and 4,000 M. of blue gas and between 5,000 M. and 6,000 M. of carburetted water gas per day.

Hutchinson Calculator

INVENTED and placed on the market by Robert M. Hutchinson, the Hutchinson Rapid Calculator will measure flows for high and low pressure gas, for air, oil and water.

The formulae by which these flows are measured are as follows:

(a) For high pressure gas, results by either Oliphant's or Weymouth's formula may be obtained, as scales are shown for each of these formulae.

For low pressure gas the formula by Spitzglass is used.

(b) For air, the same formulae are used as for high pressure gas.

(c) For oil, the formula as compiled by the National Transit Company is used.

(d) For water, Spitzglass' formula is used.

Calculations are based on the following standard conditions:

(a) For gas, 14.4 pounds per square inch atmospheric presure; 0.6 specific gravity, 60 degrees Fahr. flowing temperature.

(b) For oil, 35 degrees Be. oil, 42 U. S. gallons per barrel.

By the calculator, the volume delivered, size of pipe, length of line or pressure drop is determined.

A gravity scale on the instrument provides for the correction to any specific gravity of gas.

A dividing scale is provided, by the use of which is calculated the drop in a distribution pipe line having service or branch lines running off at intervals.

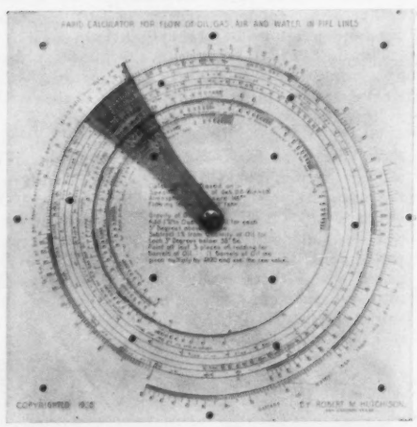
The Conversion scale may be used to convert the loss of head in feet, in water calculations, to pounds per square inch.

The pressure range covered by the calculator for high pressure gas and air extends from 29 inch vacuum to 1000 pounds gauge pressure, low pressure gas to any pressure between 0.01 inch of water up. For oil, the pressure range is from 0.01 pounds up. For water, from 0.01 pound to 1000 pounds.

The pipe sizes given for high pressure gas and air are from ¾-inch to 36-inch and for low pressure gas from ¾-inch to 54-inch.

The pipe sizes given for oil are from 2-inch to 12-inch.

For water, the pipe sizes given are from ¾-inch to 60-inch.



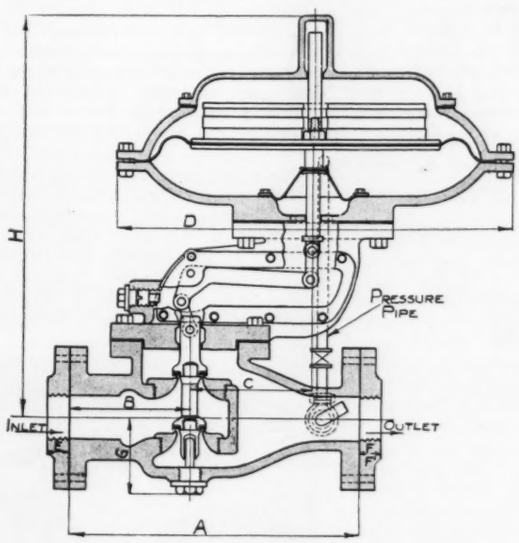
The length when expressed in feet, extends from 0.01 foot to 30,000 feet and when expressed in miles, extends from 0.01 mile to 30,000 miles.

No calculation for determination of decimal point is necessary as this is taken care of as a function of the instrument—all readings are direct.

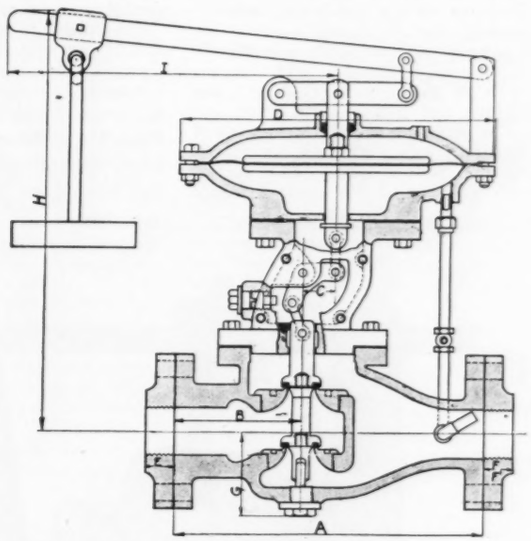
All calculations for any one problem are made with one setting of the revolving section of the calculator.

The Hutchinson Calculator is 10-inches square. The scales are set on white celluloid with a transparent indicator, mounted on a stiff back.

A pressure table on which is given gauge pressure and the corresponding square of the absolute pressure from 29 inches of vacuum to 1000 pounds pressure, is furnished with each calculator.



Low pressure balanced valve regulator



High pressure balanced valve regulator

Reliance Low *and* High Pressure Balanced Valve Regulators

THE Reliance Low Pressure Balanced Valve Regulator, recently added to the Reliance Manufacturing Company's line of products, has several features which the previous models do not have.

The standard pressure range of this regulator is from 4-inch to 13-inch outlet pressure, but special diaphragm chambers are furnished with a range of from 8-inch to 35-inch outlet pressure.

The valves are of soft seat and knife edge design. The guides are located at each end of the valve stem assembly.

The accompanying sectional view shows the construction of all parts. By removing the hand hole plate at side of toggle chamber, it is possible to lubricate moving parts without shutting off the gas. If it is necessary to change toggles, pins, valves, or valve seats, cap screws in the toggle chamber flange are removed exposing all vital parts.

The diaphragm control pipe is so arranged that the velocity of an increasing outlet load tends to draw a slight differential or lower pressure under the diaphragm. This opens the valves farther and increases both outlet pressure and volume.

SIMILAR in construction to the new low pressure regulator manufactured by the Reliance Manufacturing Company, the High Pressure Balanced Valve Regulator placed on the market by the same company, has several new features.

Parts that do not affect the efficiency of regulation, such as valve body, valve stem, valve seats, toggle pins, etc., are interchangeable with the low pressure regulator.

One feature of this regulator is the toggle locking screw. This screw which is seen at the left side of the toggle chamber can be screwed down against the toggle. This will close the valve and stop the flow of gas should one find it impossible to close the main line valve.

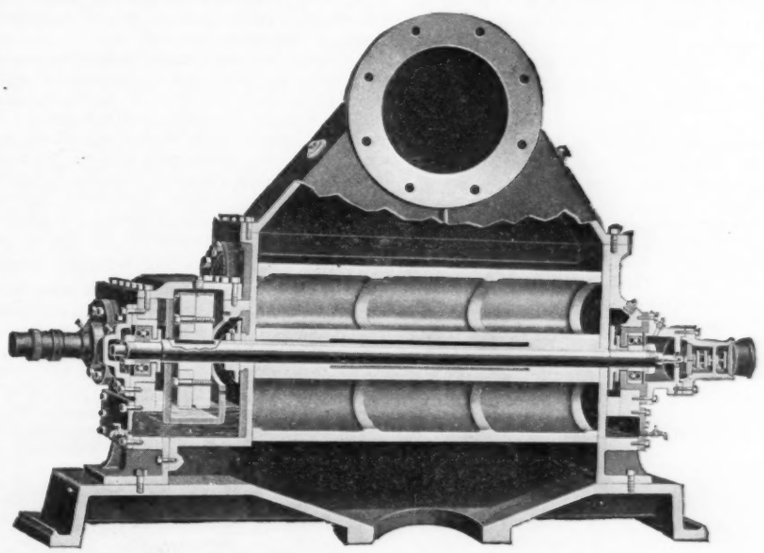
The company recommends four different sizes of diaphragm chambers to cover a range of from one pound to one hundred pounds outlet pressure. These diaphragm chambers are changeable without removing the regulator from the line.

New Orifice Meter

THE Linderman Orifice Meter is now being commercially produced by American Meter Company through Metric Metal Works.

It is manufactured in 8 inch, 12 inch, 16 inch and 24 inch sizes.

In the Linderman Orifice Meter, the aperture is automatically varied from zero to two-thirds of the area of the pipe line. The differential pressure is maintained substantially constant and measurement determined by the size of the aperture. The differential pressure changes slightly to compensate for variations of specific gravity, temperature and pressure, without the use of multipliers. The variable orifice will completely close, making it is possible with this meter to measure flows from zero to the full capacity of the meter.



Model SA Roots Meter

The New Roots Meter

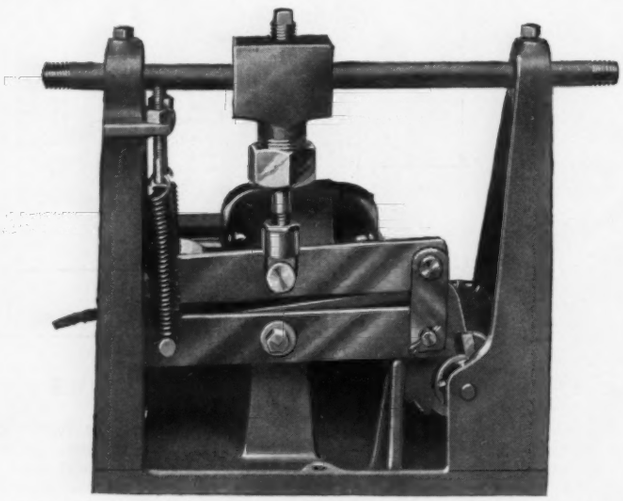
IN addition to various changes in mechanical design incorporated in the new Roots Meter, manufactured by the P. H. & F. M. Root Company, changes in operating characteristics have been made. The volume integrator, timing gear set, bearing mounting and recording instrument drive have all been changed.

This metering equipment is built in a number of sizes with hourly capacities ranging from 100 to 1,000,000 cubic feet per hour. These capacities are based on atmospheric

displacement and may be increased by raising the pressure of the gas being metered and correcting the displaced volumes to standard temperature and pressure conditions.

Two styles of the new Roots Meter, the Standard Duty and Heavy Duty types, are offered. The first is for gas measurement where pressure requirements do not exceed 10 pounds per square inch. The Heavy Duty Meter is adapted for service where pressures up to and including 100 pounds per square inch are considered.

Each meter is equipped with a Roots Volume Integrator and a Roots Differential Gauge. The indicating and recording instruments available with the new Roots Meter are Roots Distant Volume Integrator, Roots-Tripo Recorder, Roots-Quad Recorder, Roots Metergraph, Roots Demand Recorder and Roots Flow Date Recorder.



E. A. Key Company Automatic Line Sampler

An Automatic Line Sampler *for* All Sizes of Pipe

AN AUTOMATIC line sampler that may be operated in connection with any size pipe line, giving a sample of predetermined size at regular regulated intervals has been introduced by the E. A. Key Company, Inc. The operation of this sampler is dependent upon the slow rotation of a specially designed cam and two differentially linked arms, so connected to the valve stem on the sampling line that a spurt sample is obtained at equal intervals, the valve remaining open for a predetermined space of time. Due to the differential linkage when both arms of the sampler are raised by the cam in unison, there is no movement of the valve stem. As there is a slight difference in the position of the points of the two arms which rest upon the cam, the outer lever will drop off the point of the cam prior to the inner lever. This causes the valve to be opened, and when the inner lever drops, the valve is instantly closed.

The quantity of each sample is determined by the setting of the points of the two arms, a closer setting shortening the open interval of the valve, and a wider setting increasing the open interval.

For practical operation, according to the manufacturer, the sampler should be set as close as possible to the line to be sampled, and at a point where turbulence exists; for example, immediately beyond an elbow or a tee in the line, connected thereto by a ¼-inch pipe and a sample tube, the latter being necessary only when turbulence does not exist in the line being sampled. A shut-off valve should be introduced in the ¼-inch possible. The line leading from the sampler to the sample container should also be as short as possible in order to reduce the time lag of the sample.

Paramount Gas Range

NEW features of the Paramount Gas Range, a product of the Malleable Iron Range Company, are as follows: A Superheated Oven, Oven Heat Regulator, Enamel Oven Linings and Utility Drawer.

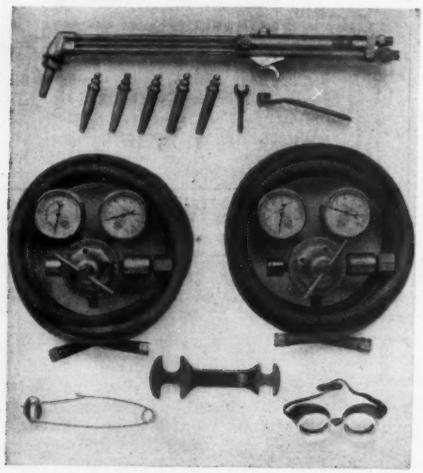
Concealed bolt and hinge construction. Oven size 13, 15 or 17 inches wide by 20¼x13 inches. Broiler 13, 15 or 17 inches wide by 20¼x7½ inches. Cooking top 22½x24 inches—32 inches high.

Equipped with open fret top as illustrated, or closed lid top equipment if desired. Cooking top is furnished with two star burners, one giant burner and one "2—1 Paramount" burner.

Cutting Outfit

A NEW general purpose Airco-Davis-Bournonville cutting torch with improved high-pressure valve construction, interchangeable trigger or lever control, and replaceable valve seat, has been placed on the market by the Air Reduction Sales Company.

The torch, approved by the Underwriters' Laboratories, is fitted with the new standard hose connections, and is furnished with either 75-degree or 90-degree angle head. Weight with tip is 3½ pounds, and length overall, 21 inches. It uses the range of tips from Nos. 1 to 8, and is suitable for cutting steel of all thicknesses from ¼-inch, or less, up



to the heaviest sections within the skill of the operator.

The high and low-pressure oxygen tubes and the acetylene tube, all of seamless brass, are silver-soldered to the head and rear end. The valve controlling the oxygen cutting jet is accessible for examination or replacement when a screw cap directly above the trigger is removed.

Interchangeable tips for acetylene, hydrogen, city gas or other fuel gases, and choice of medium or low-pressure acetylene tips are available. Standard oxygen hose connection is for ¼-inch inside diameter hose, and acetylene hose connection for 5/16-inch inside diameter hose.

Magnetic Gas Valve

THE Series 20 Valve, manufactured by the Minneapolis Honeywell Regulator Company in 1928 under the Erickson patents, is designed for use with the standard Minneapolis-Honeywell room thermostats and limiting devices and will open and close the gas supply line in response to the demands of the room thermostat or limiting device.

When the thermostat calls for heat a circuit is closed, energizing the upper valve coil and pulling up the plunger. When the room temperature reaches the desired degree, the thermostat closes the second circuit. The lower valve coil is energized, pulling down the plunger, closing the valve.

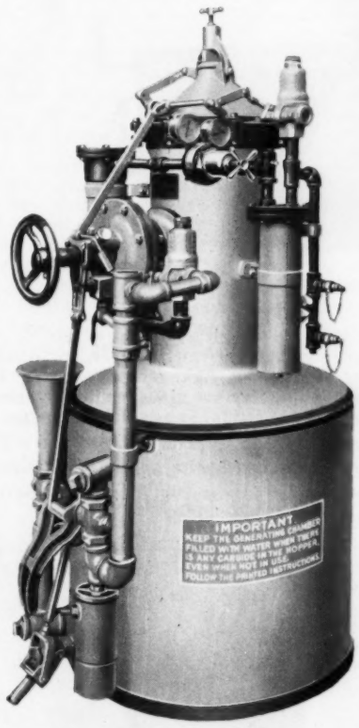
The Series 20 Valve is also designed to be operated by the room thermostat in conjunction with direct or reverse acting diaphragms commonly used on certain types of gas-fired equipment. The size most commonly used is ⅜ inch.

This valve is also manufactured in the following sizes: ⅜ inch-½ inch-¾ inch. With every Series 20 Gas Valve a special transformer designed to operate each size of valve is furnished unless the order specifies a valveless transformer. The ordinary bell ringer transformer will not operate the Series 20 Valve successfully.

New Acetylene Generator

THREE medium pressure-type acetylene generators for welding and cutting have been placed on the market by the Oxweld Acetylene Co. The Type MP-2 Medium Pressure Acetylene Generator, built in two sizes having 50 and 100 pound carbide capacity respectively replaces the earlier Medium Pressure Acetylene Generator while the type MP-3, having 300 pound carbide capacity is entirely new, no pressure type generator of this size having been manufactured by this company heretofore. These three generators are suitable for supplying pressure-type or medium pressure welding and cutting blowpipes.

The Type MP-2 generator is similar in construction and operation to its predecessor. The feed mechanism has been redesigned to make the carbide shut-off more positive. A new method is used to stop the carbide feed in case the diaphragm breaks or zero pressure exists in the generator due to any other cause.


IMPORTANT
KEEP THE GENERATING CHAMBER FILLED WITH WATER WHEN THERE IS ANY CARBIDE IN THE HOPPER, EVEN WHEN NOT IN USE.
FOLLOW THE PRINTED INSTRUCTIONS.

A new regulator, the Type R-40, is furnished instead of the line regulator formerly used. This regulator is of the stem type, having a large stem and seat, and is equipped with two gauges. One of these indicates the pressure in the generator and the other the pressure in the delivery line.

The hydraulic back pressure valve and the filter are of seamless steel tubing assembled by bronze-welding and then galvanized. The vertical pipe, leading downward to the back pressure valve and extending below the surface of the water, is fitted with an angle check valve.

The two relief valves, one mounted on the hydraulic back pressure valve and the other direct-connected to the generator, are of new design. An added feature consists of interference levers which unseat the relief valves every time the generator is recharged. This arrangement automatically prevents the relief valves from sticking, should they be called upon to function.

A clean-out door renders the feed mechanism accessible for cleaning without dismantling the generator.

The Type MP-2 generators use 1/4x1/12 inch carbide. Shipping weight in the 100-pounds size is 1,100 pounds and in the 50-pounds size 925 pounds. The former has a diameter of 3 feet 5 inches and the latter 3 feet 1 inch.

The Type MP-3 Medium Pressure Acetylene Generator has been placed on the market to meet the demand for a pressure-type generator of large capacity.

The same principle of carbide feed used in the Oxweld Balance Seal Generator is employed in the Type MP-3. The feed is driven by a motor actuated by a weight. A diaphragm pressure control is used in connection with the motor to regulate the feed and maintain proper pressure in the generator. The feed shaft bearing is protected by a dust proof cover. Two changing doors facilitate filling the hopper. Some gears are made of bronze and Monel metal and certain shafts are of special alloys. The brake control on the motor is positive in action.

A clean-cut door is provided which permits cleaning the carbide feed disc without removing the generator top. The filter can be repacked, if necessary, without breaking any adjustment of interference or relief valves. This operation is performed by removal of the top place.

The hydraulic back pressure valve is so arranged that it is always filled with water before the generator itself is entirely filled. An overflow-level check plug has been provided.

When recharging is necessary, the interference operates the relief valves, locks the feed motor so it cannot operate, and permits the carbide doors and water filling cock to be opened.

The feed motor is rendered inoperative if zero pressure exists in the generator because of a pronounced leak or any other contingency.

The operating pressure can be changed by turning the adjusting nut on the feed control. During normal operation the set pressure will not vary more than about 1 pound.

The Type MP-5 generator consists essentially of two sections, the lower being a cylindrical shell, the upper a shell in the shape of a truncated cone. The bottom is dished and all seams are bronze welded, both inside and out.

This generator uses 1¼x⅜ inch carbide. The overall height is slightly over 120 inches and the height to the top of the generator shell is 104 inches. The diameter of the shell is 42½ inches. Shipping weight 2300 pounds.

New Bailey Remote Recorders *and* Indicators

THE Bailey Meter Company has in the past year introduced equipment for recording and indicating pressure, temperature, draft, liquid level and other factors at a distance from the source.

The elements used for measuring pressure, temperature, etc., at the source, are standard equipment. For the transmission of the measurements, the Selsyn motor is used.

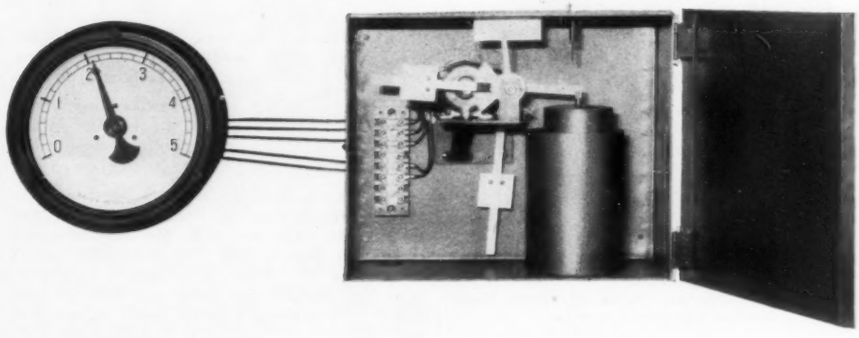
The Selsyn system consists fundamentally of a Selsyn motor and a Selsyn generator which are in some respects like three phase induction motors but have shuttle-wound rotors with definite poles whose windings are connected through slip rings or flexible leads, depending upon the type of construction, to a single phase, alternating current source of excitation. Their stators are interconnected electrically.

The generator is commonly called the transmitter and is rotated by the device measuring the factor to be transmitted. The motor is installed at the remote point and is connected to the indicator or recorder.

When the supply circuit is closed an alternating voltage is impressed on the rotors and as the motor or receiving rotor is free to turn, it takes a position corresponding to the position of the generator or sending rotor; and if the sending rotor is turned, the receiving rotor follows at the same speed and in the same direction.

The reason for this synchonous operation is that the single-phase current in the rotors induces voltages in the three legs of the stators. The three voltages are unequal and vary with the positions of the rotors. When the receiver rotor is in exact correspondence with the transmitter rotor, the voltages induced in the receiver stator are equal and balance the voltages induced in the transmitter stator so that current does not flow in the stators (secondary circuits).

If the receiver is restrained from assuming the same position as the transmitter, the induced voltages are no longer equal and balanced, and current flows in the stator circuits. This current reacts upon the rotors and sets up a torque which tends to bring them into agreement. If the transmitter is held, the torque reacts against the force which restrains the receiver, thereby tending

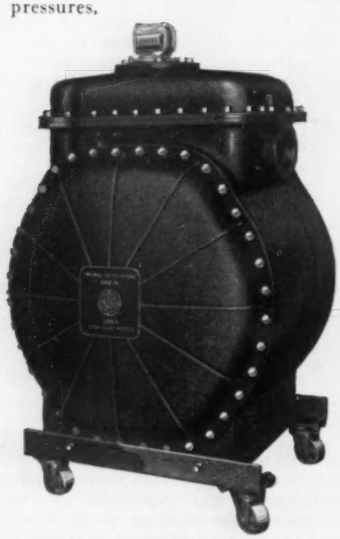


to bring it into correspondence with the transmitter.

Selsyns are used because of the shuttle-wound rotors, balance of electrical and mechanical parts and low friction ball bearings. The receiver responds to the position of the transmitter. The transmitter moves and the receiver follows. If power fails, the receiver automatically resets in agreement with the transmitter on resumption of power. Several receivers may be operated from the same transmitter.

Large Capacity Meters

THE Metric Metal Works of the American Meter Company has introduced two new ironcase large capacity meters for industrial service under both high and low pressures.



Model 500 B Ironcase meter equipped with truck for shop handling.

They are designated 250 B and 500 B and replace the 100 B and 200 B ironcase meters in the regular line of Metric ironcase meters.

Model 500 B Ironcase meter equipped with volume pressure gauge

In the new 250 B meter a capacity of 5,000 cubic feet per hour is obtained on 2-inch differential and .6 gravity gas, while the 500 B gives 10,000 cubic feet capacity.

In addition to a new valve mechanism, other features characterizing these meters are:

Timken bearings used in the crank step, crank stand and flag steps.

Alemite lubrication to all main bearings, applied from outside of case while meter is in operation.

Slide type valves and diaphragms of American meter type are used.

Below are given dimensional comparisons of old and new style.

Capacities shown are taken as a direct reading from the index on the meters. For measurement of gas under high pressure, multipliers are used, found in "Measurement of Gas Where Density Changes," such multipliers being used with the index reading to give actual cubic feet delivered at the required pressure base.

	Old Style 100 B	New Style 250 B	Old Style 200 B	New Style 500 B
Height	36⅛"	35"	41¼"	42"
Width	25"	24½"	29"	29¾"
Depth	26½"	25"	30½"	28½"
Size connections	3" flg.	4" female	4" flg.	4" female
Capacity at .5" diff.	2,000 ft.	3,500 ft.	3,400 ft.	5,000 ft.
Capacity at 2" diff.	.....	6,000 ft.	.....	10,000 ft.
Weight	580 lb.	425 lb.	1,120 lb.	870 lb.
Working pressure	0–50 lb.	0–75 lb.	0–50 lb.	0–75 lb.

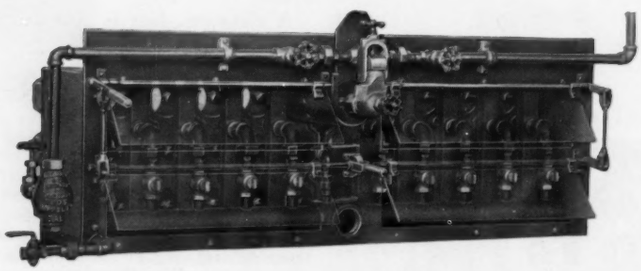
The Leahy Multi-jet Unit *for* Oil *and* Gas

SEVERAL changes have been introduced in the design and construction of Leahy combination oil and gas burner, placed on the market by the Leahy Manufacturing Company.

The Leahy Multi-jet Unit provides for the entrainment of air, and combustion is supported and intensified by refractory tile tubes surrounding each individual fire. The gas nozzles have a device for breaking up the gas prior to its combustion, and this feature in combination with the high temperature refractory tile causes the combustion of the fuel. There are no target walls or other devices in front of the burner for breaking up the gas and for providing high temperatures. The firebox of the boiler is left clear of obstructions.

All parts are removable and are air cooled. Combustion takes place within the burner setting itself.

The oil burner used in conjunction with this unit utilizes either steam or air as the atomizing agent, which comes in contact with the oil at right angles outside the burner. This feature gives it more overload capacity, and makes it adaptable for use in connection with automatic controls. The burner is equipped with a specially designed yoke type by-pass so that it can be inserted or removed in the unit.



P. & W. Pressure Regulator

AN automatic pressure reducing valve known as the P. & W. type has been developed by the G. M. Davis Regulator Company.

Sensitiveness in this Davis Regulator is accomplished by connecting the disc to the diaphragm. The steam passes through a bronze bushing which has a sliding fit.

Having a fabric insert rubber diaphragm of large area, this valve is for use in all kinds of low pressure steam circulation where the reduced pressure is low.

In order to get an average control pressure a small pipe is used to connect the diaphragm chamber with the low pressure line from five to ten feet from the valve. This pipe fills with condensation and protects the diaphragm from the heat of the steam. By placing a globe valve in this line any pumping action that might occur may be controlled.

The disc of this regulator is beveled and ground to fit in the seats. The counter-

weight holds the valve open and the reduced pressure closes it. A balance between these two forces is attained in service. When installed the diaphragm comes beneath the pipe line. Davis P. & W. Regulators may be had with either globe or expanded outlet bodies having screwed or flanged ends.

New Type Pressuretrols

TYPE H Pressuretrol is an enclosed contact, mercury-tube type steam boiler limiting device, available for both low and high voltage circuits, placed on the market this year by the Minneapolis-Honeywell Regulator Company.

The method of setting is provided by the scissors-type-indicator hands, mounted underneath the cover of the instrument. Operating pressure range can be obtained by removing the cover and setting the low and high hand on the scale, according to the pressure range required.

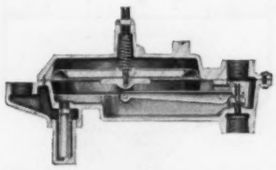
A strain release is a feature built into the Type H Pressuretrol. The heat from the combustion chamber causes additional pressure to be built up after the burner stops—and the pressure will recede below the setting of the low hand before the burner is again started. The strain release absorbs the tension thus created and the working parts of the instrument are not affected. Also during the summer months when the burner is not operating, the strain release absorbs the tension created by the drop in boiler temperature.

In dual control, either the room thermostat or Pressuretrol can shut off the gas independently—but both must be calling for heat before the gas can be turned on. Should the boiler pressure reach the point at which the Pressuretrol is set to cut off before the room temperature required is reached, the burner will be stopped and cannot be started again until the boiler pressure recedes and the room thermostat again calls for heat.

Type H Pressuretrols are installed in a vertical position, usually alongside the pressure gauge on the boiler. They are threaded for ¼ inch pipe tapping.

Reynolds Regulator

REYNOLDS Model 20 High Pressure Service Regulator was developed this year by the Reynolds Gas Regulator Company as a companion regulator to Model

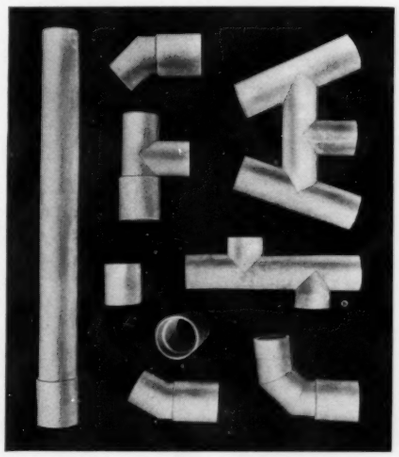


10 which was introduced last year, the principal difference being that Model 20 has to be removed to the shop for repairs while Model 10 is repairable in the line. Outstanding features in Model 20 are disc grinding of top and bottom castings, milling of recesses for the bridge in the bottom casting in a jig, so that the relationship between the bridge and orifice is the same in all castings. Model 20 also has pressed steel lever instead of cast iron.

Vitex Vent *and* Flue Pipe

VITEX Gas Vent and Flue Pipe, now being manufactured by the Plant Rubber & Asbestos Works, is an insulating pipe, designed to carry off the products of gas combustion.

Vitex is made of asbestos and a vitrifying



cement, materials which are insulating, to keep the products of combustion at a degree of heat to allow for their passage to the exhaust end of the line without condensing

Vitex is made in sizes from three inches to eight inches in diameter and a line of standard fittings is also made.

Large Wheel Truck

A NEW TYPE of two-wheel truck has been put on the market by the Oxweld Acetylene Company. Increase in wheel size was a primary consideration in the design.

The illustration shows the new truck

equipped with 24-inch steel wheels, having 3 by ⅜ inch grooved tires and a case iron hub. The hub is bored to fit the cold-rolled steel axle and a grease cup is provided.

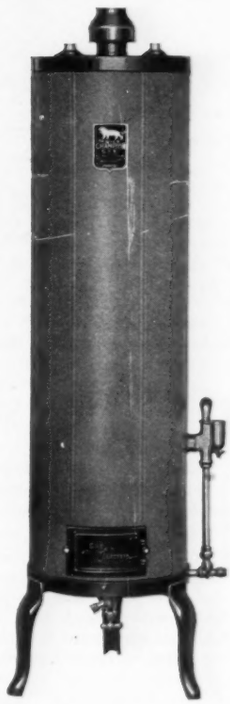
Other improvements have been made. The handle is continuous and the upper portion is bent back about 8 inches. The tool box is larger and is provided with a cover and holder for extra blowpipe tips.

Where 24-inch wheels are not required, 14-inch wheels may be used instead by changing the position of the axle to the lower set of holes which are already drilled in the frame. The same frame and axle can be used with either size wheels. No grease cups are necessary with the smaller wheels.

Champion Water Heater

SEVERAL improvements named below have been incorporated in the construction of the Champion Water Heater now manufactured by the Gas and Electric Heater Company:

1. Tank of heavy construction galvanized inside and out, tested at 300 lbs. hydrostatic pressure.



2. Insulation of 4 ply air cell asbestos.

3. Circulating heat deflector breaks up hot gases concentrating near the center of the flue.

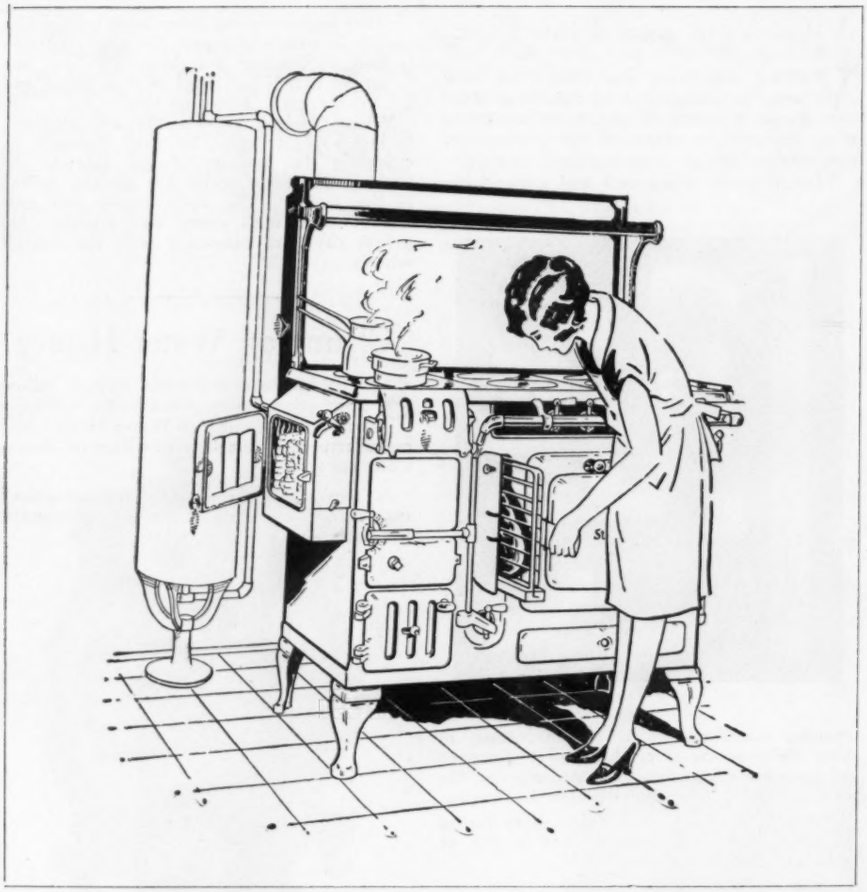
4. Outer steel casing of galvanized steel, finished in green enamel.

5. Circulating system of copper tubing carrying water to the heating element at bottom of heater and when heated thence to top of heater.

6. The G and E removable heating element.

7. The Champion thermostat. It is a graduating type control, reducing the gas to minimum flow when water has been heated, and increasing to maximum when temperature is reduced by incoming cold water.

8. The G and E Hi-Lo-Glo burner.



Lady Leisure Sterling Range showing "Vertex" broiler and "Kindelator"

Lady Leisure Sterling Range *is* New Product

THE "Lady Leisure" Sterling Range, a recent product of the Sterling Range & Furnace Corporation, includes several new features.

The "Vertex Broiler" requires no pre-heating. The meat is placed in the rack, which is slid into place and the gas lighted. The air is drawn through the burner and pre-heated. The flames issue from each side of the burner and the heat is baffled up each side of the meat.

The "Kindelator" is a gas burner running the full length of the firebox, to light kindlings, with 42 ports through which 42 gas flames ignite hard fuel or trash or furnish heat. The ports are in an inverted position so that they will not become clogged with ashes.

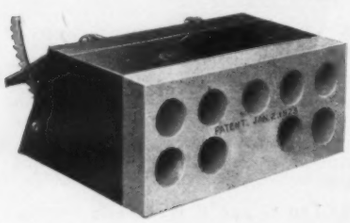
The air-cotnrolled oven burner construction is an added feature. All the air is taken in through the bottom and pre-heated before it passes to the oven.

The "water heater," combination gas or coal, consists of a brass water front for coal heat, fitting in place of the usual cast iron water front to which are joined a series of four copper coils each over a separate burner.

The "Lady Leisure" Sterling is equipped with Robertshaw Automatic Cook oven control, and comes in either splasher trim, semi enamel or full enamel. The full enamel is available in tan, blue or green color trim.

New Combustion Burners

THREE new sizes of the Mettler Entrained Combustion Gas Burners are being manufactured by the Lee B. Mettler Company—Nos. 4, 9 and 17. The number of holes in the refractory mixing block indicates the size of the burner.



The outer construction is of ¼-inch to ½-inch Hytempite cement, with firebrick wall and Sil-O-Cel insulation. These burners are of the same entrained combustion design as the standard line of Mettler Burners and differ only in that they have 1¼-inch gas and air mixing tubes whereas the standard burners have 2⅝-inch air and gas mixing tubes. The refractory mixing block is of heat resisting material. A special latch on the air adjustment door is for use on automatic control systems.

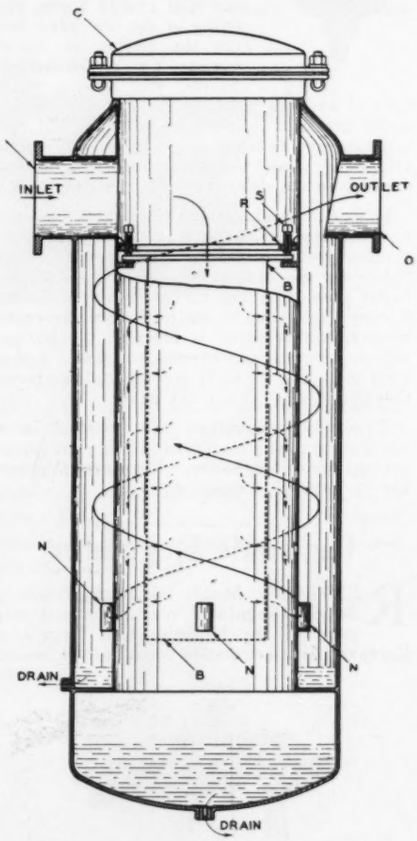
The new burners can be adapted to round or square combustion chambers in steam, hot water, hot air and other furnaces.

Bee-Ex Mist Extractor

THE Baltimore Gas Engineering Corporation announces a new mist extractor which was placed on the market this year.

The Bee-Ex Mist Extractor is of welded construction. The element can be withdrawn for inspection, cleaning or replacement of the filter. The cover is held in place by swing bolts. The jacket in the element is removable for replacement of the filter.

Gas, vapor or air enters through the inlet at I. It passes downward and through all sides of the element B. As it leaves the elemet, free of mist, it is directed through the one or more nozzles N, so formed as to give the gas centrifugal motion to throw out any entrainment in the form of drops. The gas it directed toward and out through outlet O.

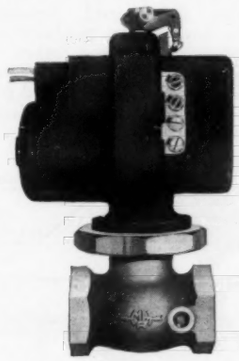


The agglomerated mist in liquid form drops from the element into the reservoir beneath, from which it can be drawn off by hand manipulation or a trap.

The Bee Ex-Mist Extractor is made in 9 sizes to handle from half a million to 50 million cubic feet of gas per day.

Motor Type Gas Valves

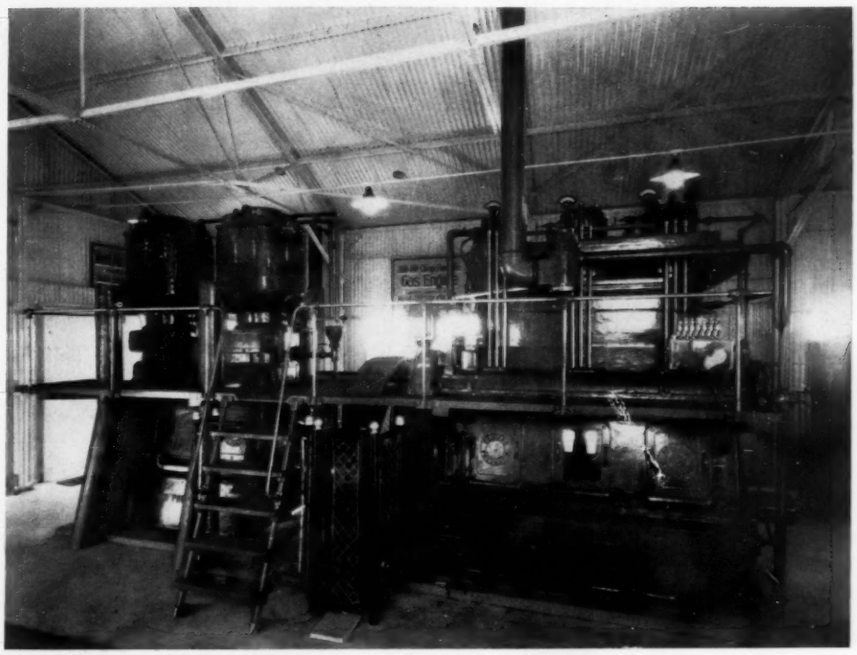
TYPE B22 Gas Valve, a new product of the Minneapols-Honeywell Regulator Company, is designed for use with positive make and break devices such as relays, remote control switches, 110 volt thermostats, etc. In the event of prolonged current failure the customer may open the valve by hand and thus permit gas to supply the burners. However, when current is resumed and in case the motor, relay, snap acting thermostat, or push button control device to which the B22 is connected, is no longer calling for heat, the B22 valve requires manual shut off and does not recycle. Specifications: 110 Volt A.C. operating current, 60 cycle standard. Other A.C. specifications available at additional net cost. Sizes ¾ inch, 1 inch, 1¼ inch, 1½ inch, and 2 inch.



The B22 is furnished with the top or power unit attached to the valve body by means of a flange, which facilitates removal of the power unit from the body when working in restricted space; the flange coupling also permits turning the top unit to the desired angle.

New Foamite Generator

A NEW Foamite Generator for fighting fires in large oil storage tanks has been announced by the American-La-France and Foamite Corporation. The new generator, known as the Model 30, is similar in operation to the Model 15 now used extensively, but has greater capacity and is to be used as a permanent installation.



New Chicago Pneumatic Vertical Compressor

THE Chicago Pneumatic Tool Company has recently added to its line of gas engine driven compressors a vertical compressor designed for gasoline extraction and direct driven at 228 R.P.M. by a 200 B.H.P. vertical, three cylinder, four-cycle gas engine.

The engine is connected to the compressor by a flexible coupling of the laminated, flexible disc type. Materials of non-corrosive properties have been employed in both the engine and compressor.

The compressor is of the vertical, duplex, double acting design for single or two stage compression to pressures ranging from 30 to 500 pounds per square inch, with cylinder sizes proportioned to absorb the power of the 200 H.P. gas engine.

The compressor cylinders are all fitted with removable liners carried in a variety of sizes to suit pressures between the limits mentioned. The sizes of the cylinders of any compressor can be changed on the job by replacing the liner with one of a different size and with the proper size of piston. Liners can be obtained of materials suitable for corrosive gases. Liner joints are sealed at the top by a shoulder which comes flush with the cylinder face between which and the head a gasket is placed. The water space at the bottom is sealed off by a rubber gasket.

All valves are located in the heads of the compressor which are of simple construction. The heads of the larger low pressure cylindes are conical. The discharge passages lead to the bottom of the cylinder. With this design of cylinder no liquids can accumulate behind a piston and wet gases can be handled.

Inlet and discharge valves are of the Simplate design. All valves are accessible and valve assemblies can be removed.

Large frame doors give access to the interior of the frame and crankcase for inspection and adjustment. Service platforms with stairs enable the operator to reach the upper parts of the compressor.

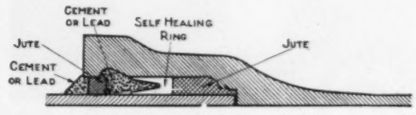
Main bearings are of the shim adjusted Diesel engine type, lubricated by pressure feed, as are also the crank pin boxes. The compressor cylinders are lubricated by a force feed lubricator. Connecting rod bearings are wedge adjusted.

The gas engine is a four-cycle design, a converted Diesel engine. All main parts of the engine are Diesel engine parts, being identical with those of the Type RH-75 Diesel engine also manufactured by this company.

Other features of the engine include removable cylinder liners, full pressure feed lubrication for bearings and two point, timed, pressure feed lubrication for the cylinders, removable valve cages.

Improved deLavaud Pipe

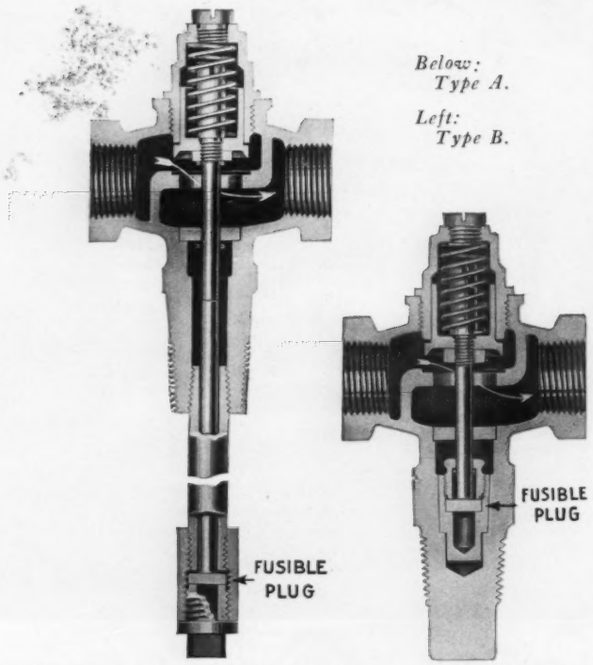
A deLavaud centrifugal gas pipe adapted to use with the gas-tight rubber ring joints is offered as a new product by the National Cast Iron Pipe Company. It is furnished either with the Standard A. G. A. No. 1 or No. 2 bell and in 12 foot lengths. Two lengths of pipe bronze-welded together make a gas-tight joint. It is furnished sand cast in lengths of 24 to 32 feet. Compounded rubber rings in gas pipe joints to prevent leakage are used in the new deLavaud Standard A. G. A. No. 1. Either the Southwestern or Bigler type of rubber ring is used.



Cross section through joint of deLavaud pipe

Cross section through same joint but using Bigler rubber ring

Safety Valves *for* Water Heaters



ACCOMPANYING illustrations show the Lovekin Temperature-controlled emergency gas shut-off valves for gas-fired domestic water heaters of the storage type. These valves have just been put on the market by the Schutte & Koerting Company, and have several new construction and operating features. Both valves are of the fusible plug type, the short valve Type "A," being designed for use on a fitting on the side of the boiler or for connection directly to the shell of the boiler if the latter does not have an insulating jacket. The long stem valve, Type "B," is designed for connection to standard tees on the top of either insulated or uninsulated boilers, the stem being long enough to reach into the water in either case.

These valves are controlled by the temperature of the water and shut off the flow of gas to the burner when the water reaches a predetermined temperature, which in most cases is not over 212 degrees. The fusible plugs are not in direct contact with the water. These valves are used in conjunction with thermostatic valves on automatic water heaters, or with hand control valves on heaters of the non-automatic type. They function when the water is heated to excessive temperatures due to failure of the thermostatic valves or to neglect to shut off hand-controlled gas coils at the proper time.

The valve is held open by the spindle, which rests on the fusible plug. When the water temperature reaches the danger point the plug softens and the weight of the valve disc aided by the light spring forces the spindle through the plug. This action closes the valve and stops flow of gas.

A new lead plug is inserted in the Type "A" valve by removing the valve disc and plug cartridge through the top opening. The valve body does not have to be disconnected from the line. To insert a new plug in the Type "B" valve the couplings must be disconnected and the entire valve taken out of the line. The new plug is inserted from the lower end. Plugs can be renewed without the use of special tools.

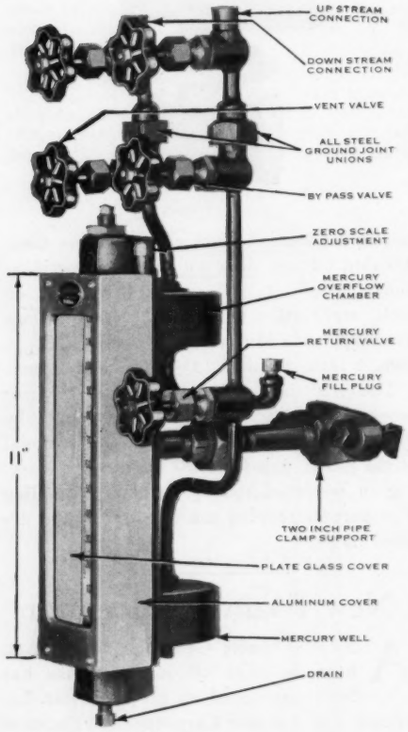
New Protective Product

Lyne-Kote is a new pipe protecting produst placed on the market by the Sherwin-Williams Company. It consists of inhibitive oils blended with coal tar and other ingredients. The coal tar is elastic, expanding and contracting with the pipe. The manufacturers claim that it is impervious to air, moisture, acids, alkali and oil.

Indicating Flow Meter

THE Meriam Co., Cleveland, Ohio, has placed on the market a new type of indicating flow meter, designed for measuring the flow of air, gas, saturated or superheated steam, oils and other liquids at any temperature, vacuum or pressure.

Primarily the meters are designed for high line pressures—1000 lbs. per square inch



or even higher, but with slight modifications they may be used on vacuum or on low pressures. Their operation depends upon the fact that the flow of the liquid or gas causes a loss of pressure along the pipe. To insure correct readings, an orifice-disc is placed in the path of the flow in the pipe, and two small tubes are connected to the pipe line, one on each side of the orifice disc. The difference in pressure between the two sides is recorded by the level of mercury, or other non-evaporating liquid of constant weight. There are no gears, springs, etc. The orifice-disc is made of Monel metal. The scale may be calibrated in cubic feet, barrels, pounds, gallons, or other quantities per hour if desired.

The welding torch consists of a pair of adjustable tungsten electrodes between which the electric arc is maintained, and a tube with valve communicating with a cylinder of compressed hydrogen. The hydrogen is directed over the electrodes on to the work, thus covering the molten area of the work with an envelope of non-oxidizing gas.

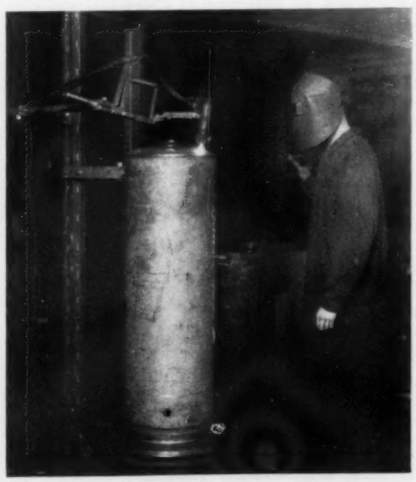
Tornado Arc Welder

A NEW automatic arc welder for welding the head in small tanks, such as range boilers, oil and gas tanks, etc., utilizing the elctronic tornado principal is placed on the market by the Lincoln Electric Company.

This machine consists of a rotating table driven by a small variable speed motor and a vertical support carrying a fixed rest and the welding head.

The electronic tornado welding head is mounted so that the length of the arc is under the control of the operator. The chief advantages claimed for this machine are high and uniform welding speeds.

The framework of the machine itself is constructed of welded steel. This type of construction has been used for a number of years by the Lincoln Electric Company in their standard line of motors and welders.

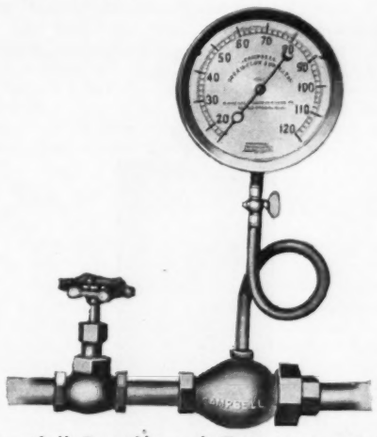


Campbell Steam Control

ANNOUNCEMENT is made by the Campbell Engineering Company of a new steam flow controller for automatically regulating steam flow. With this device, by means of an automatic or hand controlled valve, the receiver pressure is regulated until the recorder or indicator shows the desired rate of flow.

It does three things: Control steam flow, records steam flow, and gives direct reading.

The Campbell Steam Flow Recorder controls the rate of flow of steam in process work where it is necessary to deliver steam to low pressure vessels at constant flow rates. It records and indicates such flow simultaneously.



Campbell Pumpkin-seed Type steam control

The Campbell Steam Flow Recorder conflow rate directly in pounds of steam per hour, which may be varied as the operator desires. It differs from other appliances in that it controls and records steam flow at the desired rate.

Campbell "Watermelon Type" steam control

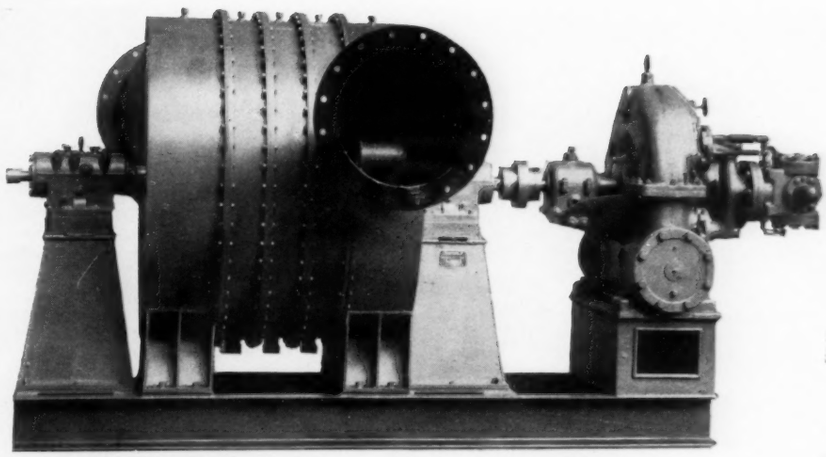
Essentially the controller consists of a combination of receiver, calibrated nozzles and recording or indicating instruments.

In addition to controlling and recording the admission of steam to process work, these Campbell Controllers are used to regulate steam to gas or oil burners, to distribute and control steam for drying work, or for heating buildings, or to regulate steam flow to any point where an appreciable drop in pressure is permissible.

The "Pumpkin seed type" is a single controller having only one receiver and one orifice nozzle. This type is used where relatively small flows are desired, as on steam lifts. When proportionate flows to two points are desired, two receivers, two orifice nozzles, and one recorder may be combined by connection with a common pipe into a double Pumpkin seed controller.

When larger quantities are to be used, the "Watermelon type" serves, and when fitted with two calibrated orifices will proportion the flow to two points in the ratio of the orifice areas.

The Campbell Steam Flow Recorder indicates and records the flow in pounds of steam per hour. Where a permanent record of steam flow is not essential indicators are furnished and are designed to match the orifice used. They, too, read flow directly in pounds per hour.



Sturdevant Single *and* Multi-stage Compressors

B. F. STURDEVANT Company has brought out in 1928 as standard equipment the Multistage and Single Stage Compressors designed for handling gas at high pressures.

The Multistage Compressor embodies the principle of the fan type booster. It is constructed to give high boosting pressures and still operate at low speed. It has a self governing characteristic. As the volume of gas required decreases, the power consumed by the compressor also decreases, although the pressure remains constant. The compressor and driving unit are direct connected and mounted on a common base.

The Singlestage Compressor is designed along the same lines as the Multistage Compressor, being used where the pressures run high enough to require staging. The wheels are pressed alloy steel and heat treated.

Both the Singlestage and the Multistage Compressors can be used for handling air or gas.

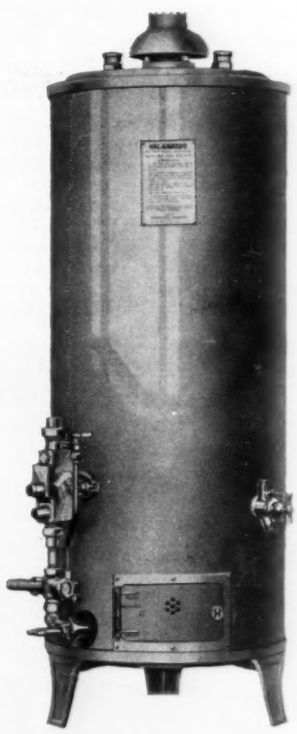
Humphrey Storage Heater

IMPROVEMENTS noted in the Humphrey Kalamazoo Automatic Storage Water Heater introduced in 1928 are as follows:

1. Insulation consists of 1½ inches of rock wool, encased in an Armco iron container that on the inside is of No. 20 gauge thickness, galvanized inside and out to prevent deterioration. The outside is of black finished in two-tones green.

2. Underneath the boiler is a burner with the operation controlled by the Humphrey Snap Valve. It causes the burner operation to be full on or off.

3. A pilot burner, which is separate and distinct from the burner itself.



4. The Combined Relief Valve and Drain Cock, and the Humphrey Safety Pilot Automatic Gas Cut-off which in the event that the pilot is extinguished, shuts off the main gas.

Broiler Attachment *is* Feature *of* New Roper Range

GENERAL improvements are announced in the entire line of ranges manufactured by the Geo. D. Roper Corporation.

An added feature in the company's line of domestic ranges is the change in the broiler. The new arrangement combines the operation of opening the broiler oven door with that of pulling out the broiler rack, facilitating the handling of the rack and making it more steady. The new feature prevents the rack tipping on being drawn out. This feature is incorporated in the entire line of domestic ranges.

New Clark Jewel Range

THE new Clark Jewel Gas range, manufactured by the George M. Clark Company, has several new features incorporated in its construction.

The concealed manifold and cock handles are among the new features. The front manifold is underneath the cooking top with its turned back lower front edge. New angle cocks have bakelite handles pinned to cock shanks with brass screws.

The back guard is of heavy metal, panelled with turned back edge and height; it is secured by a band iron piece at either end and bolted at the middle through the high shelf.

A rounded front edge, with bottom edge turned back is a new feature of the high shelf. The bracket shelf has an inserted splasher lining. Bracket and splasher are bolted together.

The utensil drawer is partitioned and has a positive stop.

Specifications for the new model are as follows:

Baking oven—17 inches wide, 20 inches deep, 14 inches high.

Broiler oven—17 inches wide, 20 inches deep, 9 inches high.

Cooking top—21¾ inches wide, 22⅜ inches deep.

Cooking top—33 inches from the floor.

Outside measurement with shelf—51½ inches by 27⅞ inches.

Outside measurement without shelf—48 inches by 27⅞ inches (Length 5 inches less without Lorain.)

Elevated shelf—8 inches by 21½ inches, and 50¼ inches from floor.

Weight, crated—280 lbs.

In-A-Wink Cleaner

SUPERIOR Laboratories have placed on the market for the first time this year a cleaning solvent called In-A-Wink. It is a new association of various solvents compounded with an air floated earthy substance into the form of a cream, for removing oxidation or discoloration from metals, and grease and dirt from enamel and porcelain surfaces. It is especially designed for the cleaning of gas appliances.

Invincible Water Heater

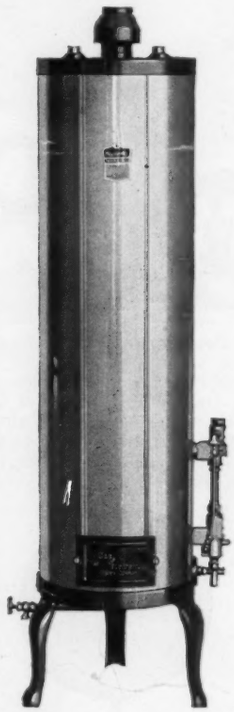
THE Gas and Electric Company has placed a new water heater on the market which is closely allied to its other line of heaters, and of which the important features are:

1. Tank is galvanized inside and out, tested at 300 pounds hydrostatic pressure.

2. The insulation is four ply air cell asbestos, and one ply of sheet asbestos.

3. Outer casing is of galvanized steel enameled in green.

4. The removable heating element absorbs the full flame of the burner.



5. The Invincible Safety Gas Control is one of the "snap" action type, and can be adjusted from 90 to 180 degrees.

6. The Bunsen burner yields a blue flame.

7. A drain faucet located at lowest water level facilitates flushing of sediment from the heater.

Type B2 Aquastat

THE B2 Aquastat, manufactured by the Minneapolic-Honeywell Regulator Company for the first time provides a source of direct control of the heating plant temperature and is designed for use on hot water heating plants. This instrument is of the immersion type with the thermostatic element indirectly in contact with the hot water. This device is also available for use with Series 10 equipment and is known as Type B6510 Aquastat.

New Type Purifier Tray

A NEW type of purifier tray is being manufactured by the Semet-Solvay Engineering Corporation.

The new tray is the invention of F. C. Wellington, of Chicago, for several years superintendent of the Illinois Power Company's gas plant at Springfield, Ill.

The new type tray, for which patents are pending, contains no metal. It is assembled by means of wooden dowels, fitted and trimmed flush with the surface of the boards. When the tray becomes moist during service, and the wood expands, the assembly is made tighter.

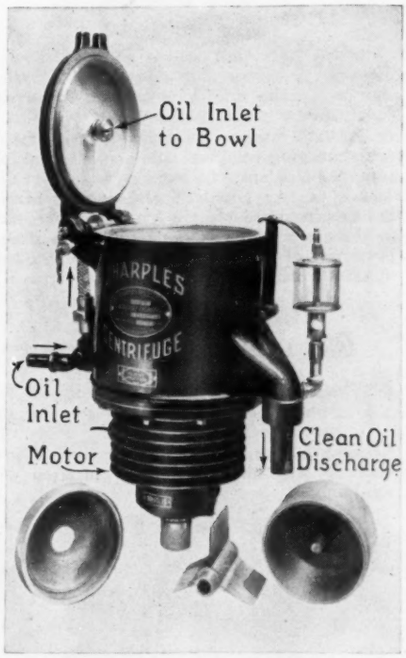
B-3 Whizard Centrifuge

SHARPLES Specialty Company offers this year a model B-3 Whizard Centrifuge for purifying fuel and lubricating oil for small Diesel engines. Specifications of this model are as follows:

Capacity: Fuel oil 15-25 gallons per hour. Lubricating oil 15-20 gallons per hour.

Weight: Complete machine, 66 pounds, bowl only 4 pounds.

Drive: Direct connected to 1/5 H.P. motor. Can be furnished in 32, 115 and 230 volts, direct current and 110 and 220 volts, single



phase, 60 cycle A.C.

Mounting: Suitable for wall, engine frame, etc.

Bowl: Has three parts—shell, top and 3 wing; 4¼ inches in diameter, 3 inches long, weighs 4 pounds. Dirt holding capacity 26 cubic inches—1½ pounds.

Connections: Centrifuge is piped permanently into system.

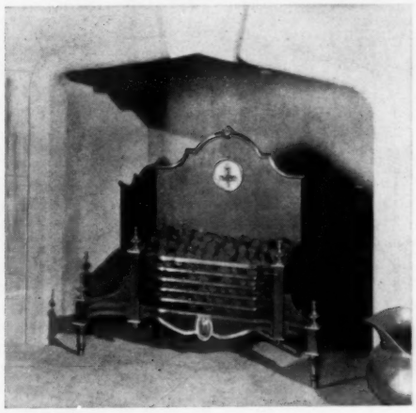
Gas Tight: Gasketed covers prevent escape of oil vapors.

New Homestead Fireplace Heaters

HOMESTEAD Heater Company announces two new types of radiant heaters for use in the fireplace with gas as the fuel.

Coalfire Number 24, as are the other Homestead coalfire type heaters, is patterned from the coal baskets of England. A layer of coals of refractory clay is used to obtain the effect. Concealed behind and underneath the coals, is a radiant heat construction. After being lit the radiants become incandescent, and the heat passes on through the coals. Andirons are of bronze, while the basket itself is finished in polished steel. Specifications are as follows: Width, 20 inches; height, 20½ to 26 inches; depth, 10 inches; capacity, manufactured gas, 45 cubic feet; natural gas 24 cubic feet. The heater is suitable for a fireplace 30 to 42 inches wide.

Woodfire Number 02 is a reproduction of birch logs piled up over radiant embers. It is also available with oak logs. Andirons are wrought iron finished with brass ornamentation. Specifications are as follows: Width, 20 inches; height, 18 inches; depth, 10 inches; capacity, manufactured gas 45 cubic feet; natural gas 24 cubic feet.



Homestead Coalfire

Homestead Woodfire

"Cristite"—*a* New Product

THE Victor Oxy-Acetylene Equipment Company announces a late development of abrasion resistant metal — "Christite."

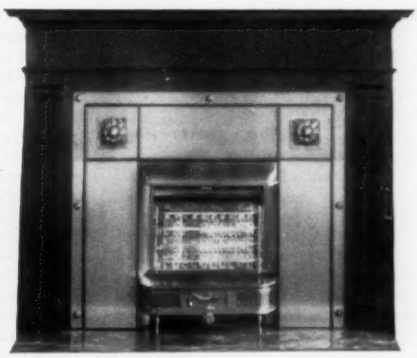
"Cristite" is produced in several series, the most prominent ones being No. 1, No. 2 and No. 3.

"Cristite" Series No. 1 shows an average scleroscope hardness of 92.8 in casting and 101.17 after application.

Humphrey Mantel

GENERAL Gas Light Company, manufacturers of the Humphrey Radiantfire heaters, has brought out during the past year a complete mantel and Humphrey Radiantfire heater combined. The mantel is constructed of hard wood and is finished in either flat white or mahogany. The heater is a ten radiant Humphrey.

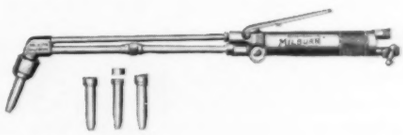
This unit can be installed while the house is under construction or after completion



New Milburn Torch

A NEW Milburn Combination Cutting and Welding Torch was brought out this year by the Alexander Milburn Company, Type TI.

In the Type TI torch, in order tot change from cutting to welding it is not necessary to change the tip. A convertible feature of the tip changes it from a cutting to a welding tip or vice versa by turning the

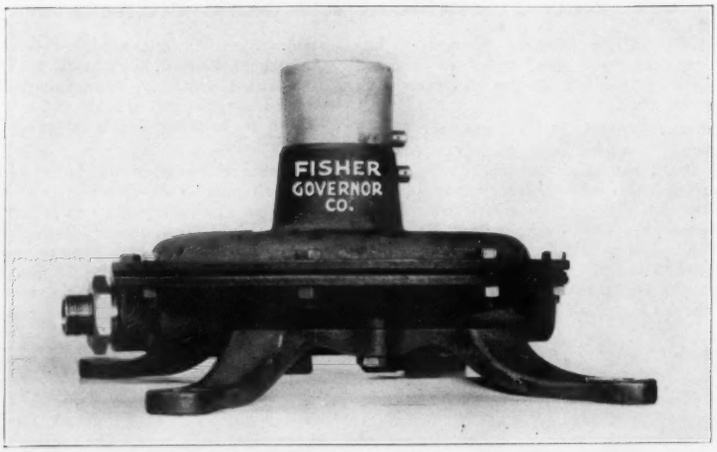


tip. In one position the gases are automatically passed through the preheating gas passages while the high pressure oxygen is carried through the central hole for cutting.

In the next position, made by a quarter turn of the tip, the cutting oxygen is cut off and the welding gases are conveyed through the central passage of the cutting tip.

Torch heads, valves, bases and other parts of bronze forgings, have a tensile strength of upwards of 5,000 pounds per square inch. The seamless high pressure tube is drawn with triple thick walls and is of nickeled silver.

The new tips are constructed so that when the tip has outlived its usefulness as a cutting tip, it is still serviceable as a welding tip.



Fisher Pilot Operated Boiler Gas Fuel Governor

THE Fisher Governor Company offers a new type of governor in their design of a pilot controlled Boiler Gas Fuel Governor Type 519.

The body of the regulator is constructed to provide maximum gas flow with minimum pressure drop. The valve ports are provided with an internal contour construction providing for stream line flow of gas through the body.

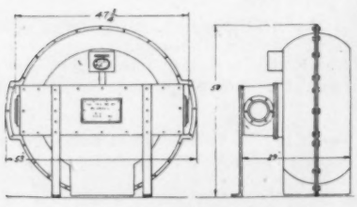
The pilot unit consists of a strainer, employed to keep dirt and pipe scale from the pilot valve, and needle valve. The pilot valve may be of an entire bronze construction, with laminated bronze diaphragm, or may be fitted with steel or corrosion resisting alloys for corrosive service. Units are built for operating pressures up to 500 lbs., and are adaptable for all gas fuel governor sizes.

The control connection is connected directly to the boiler, and pilot set for the service pressure desired by adjusting the adjustment nut on top of the Type 777 Pilot. The main valve spring is given tension to provide a positive opening of the governor when the pressure is removed from the diaphragm. As the boiler pressure builds up, exceeding the setting of the pilot control, the pilot opens, allowing pressure upon the main diaphragm. Upon the dropping of the boiler pressure, the pilot closes, and the pressure on the diaphragm is bled off through a cracked needle valve, the spring of the main valve opening the governor, allowing more gas to the burner. The bleed from the needle may be piped to the burners or to the sewer. The fuel governor never closes completely, being so adjusted at the factory that the main valve ports are always cracked open, allowing sufficient gas to pass to maintain a pilot light burning. Complete operation, opening and closing will be obtained with about one pound pressure change at the point of setting of the pilot valve.

The pilot is also applied on pressure regulators and relief valves where a sensitive control is desired. When the units are desired for any particular service, the manufacturer should be advised fully of pressures, temperatures, pipe size, and operating medium.

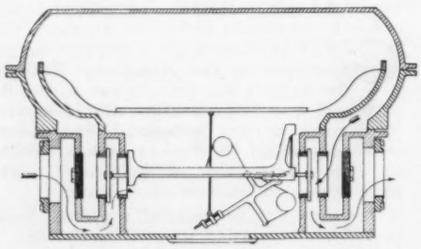
Sprague Big Six Meter

SPRAGUE Meter Company this year offers the Bix Six positive meter which passes 15 cubic feet of gas per revolution. Volumes from flows for pilot lights up to 24,000 cubic feet per hour with 1 ounce drop are measured. Capacity with 1 inch drop is 18,000 cubic feet per hour; with ½ inch drop, 9000 cubic feet per hour. Inlet pressures from 1 inch up to pounds of pressure handled. Bristol recording pressure



gauges are furnished with the Big Six meter where gas is measured at intermediate or high pressures, if desired.

This meter is of the poppet valve type, which is actuated by a double set of springs.



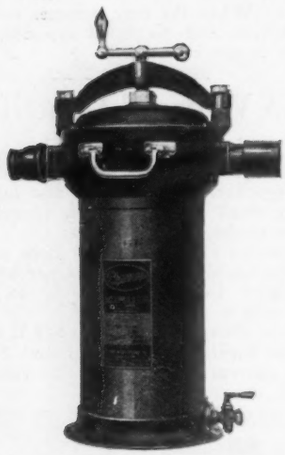
Valve seats and covers stand in a vertical position, cleaning themselves of foreign matter. A hand hole in the front permits access to the valve and mechanism chamber for speed adjustments, or the entire front plate can be removed giving clearance for removal of the entire valve mechanism as a unit.

The one diaphragm of the meter is made of acid resisting lamb skins, tanned to Sprague requirements.

Height of the meter over all is 50 inches; length, 49 inches; depth, 29 inches. Distance from face to face of flange is 47¾ inches. The index reads to one hundred million cubic feet. It has six-inch standard flange connections and weighs 1150 pounds.

Phomene Accumulator

MODEL 401 Phomene Accumulator has been put on the market this year for the first time by the Pyrene Manufacturing Company. It is a foam making unit charged with dry powder which makes about 380 gallons of foam when water under pressure of 30 pounds per square inch or higher, is admitted into it. This accumulator may be applied as the foam making unit of an automatic foam system on a fixed hazard, or it may be used with hose for general foam coverage. In the former case, the water line to the accumulator and the foam line from the accumulator to the hazard, are put in permanently, and an automatic water valve may be installed in the water line, to give full automatic operation. For manual use, it may be permanently installed with a foam hose or, in certain cases



may be portable with hose on both water and foam ends.

The two features of this fire extinguisher, differentiating it from other models of the company's foam making devices, are that it uses a dry powder; and second that it can be recharged after use within 30 seconds, as the can in which the charge comes packed is designed for direct insertion into the accumulator.

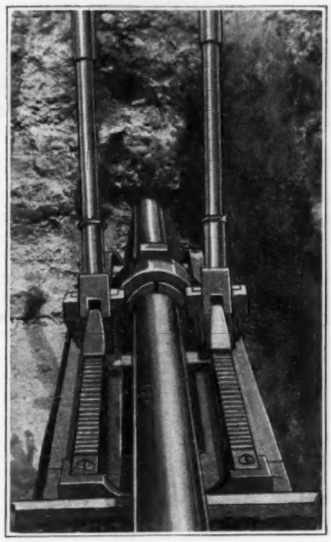
Regulator Attachment

THE spring top attachment to low pressure service regulators, a new line of manufacture by the Reynolds Gas Regulator Company, makes possible adjustment for regulators used in connection with appliances.

Simplex Pipe Jack

TEMPLETON, Kenly & Company, Limited, has added the Simplex Pipe Pushing Jack to its line of manufacture during 1928. It is manufactured in two sizes. Both the smaller and larger machines have a 25-inch travel, and the time required for pushing the pipe 25 inches and resetting averages from five to six minutes. The jacks can be operated by two or four men, according to soil conditions. When solid cribbing or blocking is difficult to obtain it is possible to hold the jack against the back pressure with one lever while the other lever is being operated.

Each size of pipe requires a set of tapered

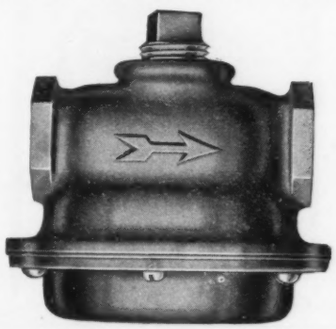


jaws, for the reason that true gripping is necessary in order that the pipe can not be crushed.

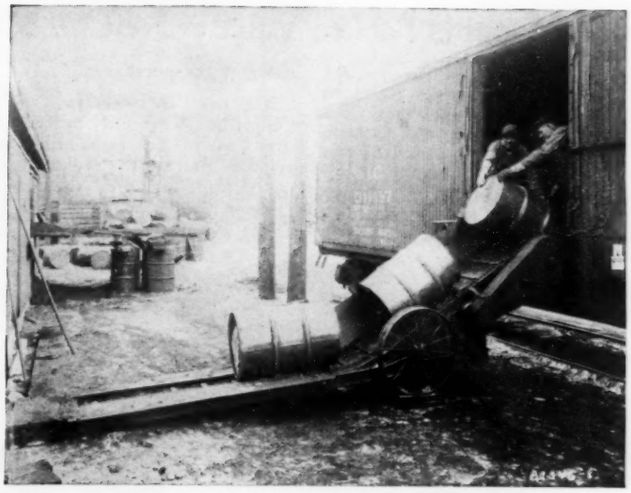
Simplex pipe pushing Jacks are obtainable in two sizes—No. 332, which handles pipe ¾ inches, 1 inch, 1¼ inches, 1½ inches and 2 inches in diameter, and No. 334 which handles pipe 2 inches, 2½ inches, 3 inches and 4 inches in diameter. Equipment for each consists of one set of tapered jaws, steel lever bars and extension pipes.

Refrigerator Regulator

THE Gas Fired Refrigerator Regulator designed for gas fired refrigerators by the Reynolds Gas Regulator Company, is for use where it is necessary to



carry an even pressure to the burner. This will control ordinary varying street pressure. While it was designed for a gas refrigerator, it has also been used in connection with soldering irons, garage heaters, calorimeters, and pilot lights for oil burners.



New Barber-Greene Self-Propelled Flight Conveyor

A SELF-PROPELLED flight conveyor has been placed on the market by the Barber-Greene Company.

This flight conveyor is power-propelled, or self-driven. It is manufactured in two sizes, 24 and 30 feet long, and embodies features of the other Barber-Greene yardsmen or coal handling machines. Through its traveling feature, it is capable of traveling forward or into the pile at the rates of 29 feet, 54 feet and 92 feet per minute. The machine has a reverse speed of 24 feet per minute and a capacity of one to two tons per minute.

The trough is 21 inches wide and 11 inches deep. The bottom plate of the trough is of high-carbon steel and is renewable. This metal has the quality of resisting abrasion, and is identical in content to the metal used for the corresponding part of the Barber-Greene Car Unloader.

The flights are of 3/16-inch steel, being 16 inches long and 4 inches high. These are cup-shaped for digging.

Trimming is a new feature with this new Barber-Greene Yardsman. The elevation of the boom is controlled by a power hoist. It has a minimum discharge height of 9 feet (on both machines). The maximum height of discharge on a 24-foot machine is 15 feet 10 inches, and on the 30-foot machine, 17 feet 6 inches to the center of the head shaft. The discharge heights are lowered approximately 4½ feet when the screen is used, according to the angle of the screen.

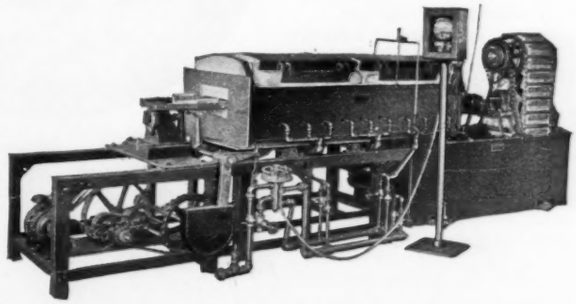
The conveyor is equipped with a gravity screen over which the material slides at the discharge end of the boom. It is also equipped with a chute for discharging the screenings. The angle of this screen may be adjusted by the operator by means of a crank conveniently located at the lower end of the boom.

Traction is offered by a three-wheeled truck, two wheels being used for power and one for steering. The wheels can be swiveled when not engaged.

Under ordinary working conditions the machine will handle a ton of coal a minute. It may run as high as two tons a minute under ideal conditions. It handles lump as well as fine coal. It is priced within reach of those operating yards handling as little as 2,500 tons annually.

Reciprocating Hearth Type Heating Machine

THE reciprocating hearth type heating machine was first built by the American Gas Furnace Company for the hardening of steel pens, and is now being used for the hardening of phonograph needles, sewing machine needles, ice picks,



springs of various types, parts for adding machines, calculating machines, sewing machines; and for heavier parts such as washers for roller bearings.

The slab in this machine moves forward and backward, the forward stroke being interrupted by coming in contact with a bumper which results in the work being carried forward over the slab by its own momentum.

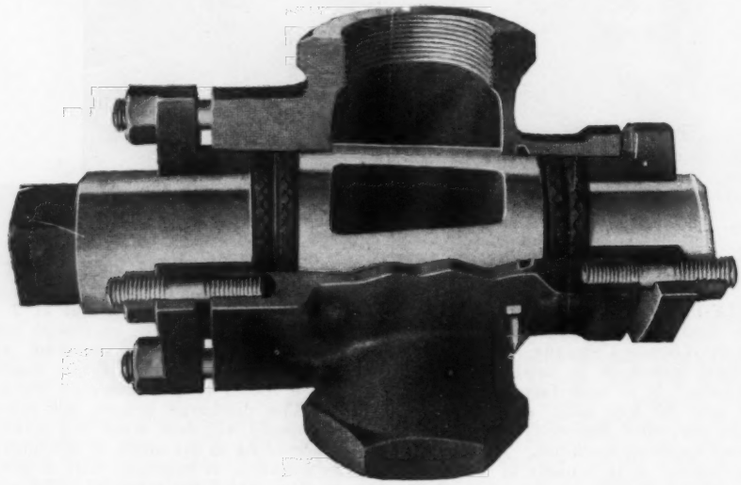
A new means of suspending the hearth slab has been devised which results in greater uniformity of its movement with a resulting improvement in the quailty of work. The machine has a heavy refractory lining backed by a layer of insulation. Metal working parts in the heating chamber are of heat resisting alloy and burners are arranged in sections for independent control and to permit operating with a thermal head at the charging end if it is desired.

Northern Double Packed Valve *is* New *on* Market

THE new Northern Double Packed Valve manufactured by the Northern Pump Company is of the Stop Cock type, packed both at the top and bottom. Stuffing boxes located at the top and bottom of the plug keep it from leaking.

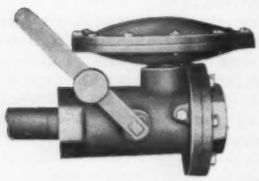
The valve is lubricated by a positive method. Alemite fittings are installed on valves which require lubrication, at the request of the purchaser.

The ports in Northern Valves are rectangular in shape, of practically the same area as the corresponding pipe. These regular ports are called Smoothway. If the valve is required for throttling service, Diamond Ports may be had at the option of the purchaser.



"Life Saver" Valve

"LIFE SAVER" Automatic Shut Off Valve is the trade name of the new valve placed on the market by the Universal Smokeless Boiler Company. These valves are set to close automatically in case the gas pressure falls below ½ ounce. They must be opened by hand, which is accomplished by raising the lever and weight until the internal pawls engage and hold the valve open, but it will not stay open unless the pressure is ½ ounce or more. There are no springs or adjustable weights. These valves are manufactured for household use primarily, but can be used on low pressure installations of any size. In case of deterioration or failure of any part of the "Life Saver" the valve will close, thereby shutting off the gas.



Specifications for the valve are as follows:

Body: Cast iron.

Working parts: Bronze.

Diaphragm: 8-oz. duck, treated to resist the effects of gas.

Gasket: Asbestos.

The New Trimo Wrench

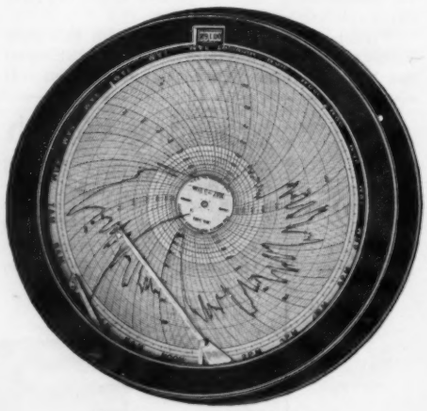
THE Trimont Manufacturing Company, Inc., makers of Trimo Pipe Wrench, announce an improved Trimo, the swinging steel frame of which has been strengthened by overlapping side lugs, an integral part of the handle, which brace the frame against lateral distortion or spreading.

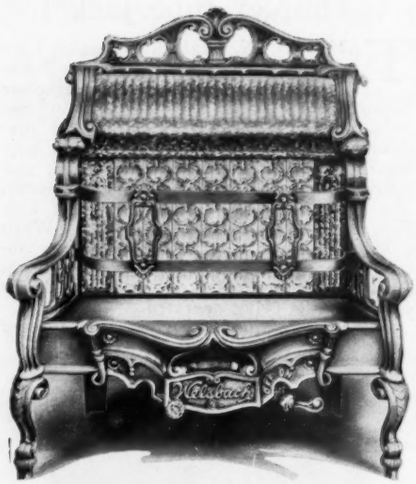
The replaceable insert lower jaw and the nut-guards which protect the adjustment are features of the improved Trimo.

An Improved Flow Meter

AN electric flow meter operating on the electrical self-balancing inductance bridge principle, has just been brought out by the Brown Instrument Company.

The instruments have a number of new features, which are: Absence of voltage regulator, compensation, "step" contacts or contacts dipping in mercury, pressure-tight bushings in manometer, and electrical circuit inside pressure chamber; long-distance operation; electrical circuit requiring three connections—made at installation of instrument; extra indicators or recorders working off same manometer may be connected without interfering with readings of meter already connected; an electric clock motor for recorders; a recorder that produces a separate record of total flow on the same chart carrying the corresponding rate of flow record; a complete line of indicating, recording, signalling and controlling instruments, with numerous combinations and manometer ranges.





Welsbach Space Heater

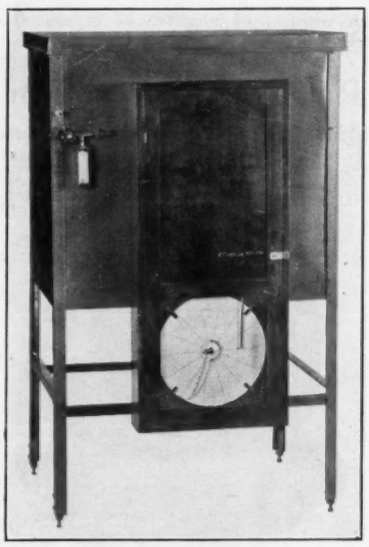
AN addition to Welsbach Company's line of "Radiant Space Heaters" are the three new numbers 67, 69 and 71.

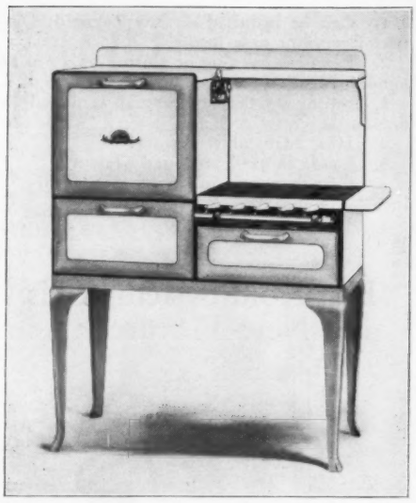
These gas heaters, similar in design and differing in size only, are finished in golden brown. New features are the "Welsbach Million Dollar Burner Manifold," which generates cones of flame within the "Clay Glower"; clay burner caps, a fine wire gauze air filter. In addition, there is a choke for regulating the air-gas mixture when lighting the heater. The clay header, holding glowers in place, enables each glower to be lighted from top to bottom.

Number 67 is a ten glower, number 69 a twelve glower and number 71 a seven glower.

New Acme Gravitometer

THE Refinery Supply Manufacturing Company announces the addition of an Automatic Temperature Compensator on the Acme Recording Gravitometer. This specific gravity recorder can be used on both artificial and natural gas and the addition of this new compensating feature makes it automatically compensated for temperature and barometric changes. The Acme Gravitometer will give results which are corrected for the existing conditions of temperature and barometric pressure.





Sunray Number Four

THE Sunray Stove Company has recently placed on the market its new Number Four series. The illustration shows the porcelain trim equipped with Robertshaw Thermostat.

One feature of the new series is the two-tone finish—grey and white. The doors are pressed from one piece of steel. The outer edge is grey porcelain finish while the center panel is white. The legs and base angle are also grey finish.

Other features are: all bolting concealed, rounded corners, and full lined ovens with either rust-proof metal or porcelain finish as ordered. The four cooking top burners have 45 ports in each burner.

These ranges are also furnished in color trims—green, blue or red—the color being stenciled on certain parts, and all parts with color are removable.

Armored Gaskets *by* Crane Packing Co.

"JOHN CRANE" armored gaskets, a new product of the Crane Packing Company, either copper covered or aluminum covered, are for use in exhaust

coupling service on Dresser and Dayton couplings used on gas lines.

The armor prevents the asbestos core from disintegrating and prevents gasket

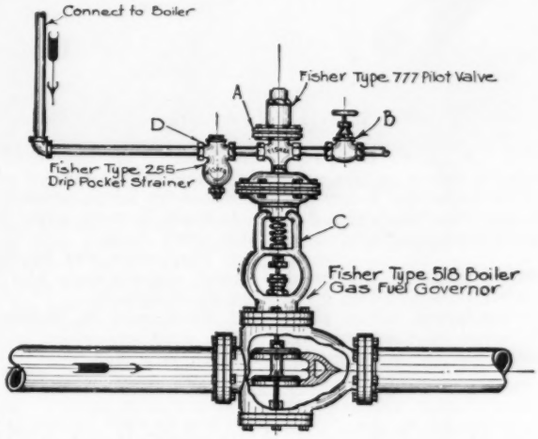
sticking to the pipe. The gaskets also provide a seal.

Where desired, armored gaskets can be used more than once.

Regulators for Use *with* Liquified Petroleum Gas

THE Fisher Governor Company has recently designed a regulator for use with liquified petroleum gas.

The illustration shows construction of the regulator. The gas enters at the inlet, this connection being the standard for high pressure gas tanks, passes through a small orifice to the operating chamber of the regulator. When the pressure is reached that overcomes the downward thrust of the adjusting spring, the diaphragm and plate move upward, tending to straighten out the toggle spring, which in turn causes a lateral movement of the self-aligning valve to the seat. The valve disc is a composition, according to the makers, unaffected by a liquid or gaseous propane and butane. A propane gas resisting material is used for the diaphragms.



The valve is built in three diaphragm diameter sizes, namely the 7½-inch Type 716, the 9½-inch Type 708, and the 11-inch Type 701.

The regulators are fitted with adjusting spring, giving a reduced pressure range between 4 inches and 16 inches water pressure. The spring adjustment nut is protected by an aluminum or brass cap, held against the spring case by a set screw, preventing a change of pressure by irresponsible parties.

The regulators have a maximum capacity of about 1400 cubic feet per hour.

300 Ampere Gasoline Engine Driven Welder

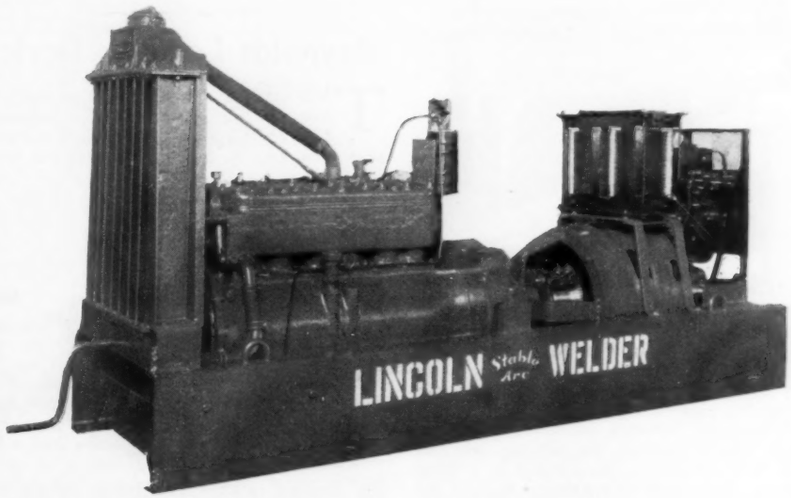
THE Lincoln Electric Company announces a new 300 ampere gasoline engine driven welder, known as Model S-1964. The welding generator is rated at 300 amperes in accordance with N. E. M. A. standards and has a current range from 75 to 400 amperes for metallic electrode welding, and is direct connected to a six cylinder Buda Model HS-6 engine, operating at 1500 R. P. M.

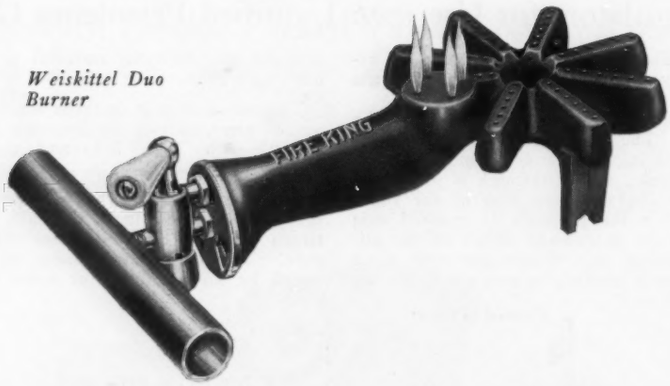
Both units are mounted on a welded steel base.

The engine has a rating of 27.3 H. P. and gives a brake H. P. of 41 while running at the operating speed. The gas tank is located in the channel iron frame under the engine.

The generator has the laminated magnetic circuit with separately excited field, stabilizer, variable voltage and steel construction features characteristic of the company's line of "Stable-Arc" welders.

The overall dimensions are 93 inches long, 35 inches wide with an overall height of 45 inches.





Weiskittel Duo Burner

Weiskittel & Son Company Offers New Product

WEISKITTEL & Son Company, manufacturer of stoves, ranges, etc., has placed on the market a new gas range—the Fire King. Features which differentiate this number from other models of the company are:

1. The Duo burner, which is illustrated above, and which, when turned half on gives a simmer burner, when turned full on gives a supply of gas sufficient for quick cooking.
2. Spring balanced doors, with springs located under the bottom of the stove away from the heat. Tension of springs can be adjusted by thumb screws.
3. Made in three sizes, for large, medium and small space.
4. The ranges can be supplied with heat control, and are made also with heat recording thermometers.
5. They may be obtained in green and white, gray and white, and blue and white enamel.

Neco B & B Shock Absorber-Rod Swivel

NORTHRUP Manufacturng Company offers the Neco B. & B. Shock Absorber-Rod Swivel as a new product of the company for use in well drilling. Relief for the rods from the strain caused by the snap at the changes in direction of the stroke from up to down, and from down to up is the primary purpose of the absorber. The spring affords a 5/8-inch cushion to absorb the vibrations, and can be used for any well up to 3,000 feet, but beyond that depth additional cushions are needed to hold vibration to a minimum and maintain adequate protection of the rods. The secondary purpose of the device is to act as a swivel upon which the rods below it can turn, conforming to the pumping motion and to the variations in direction of the hole.

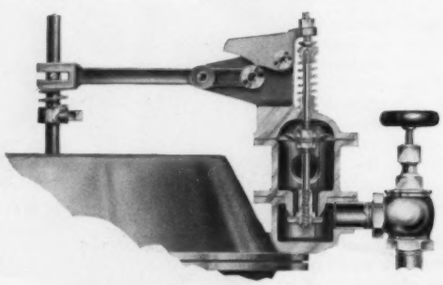
Buck In-a-Drawer Broiler

AN INNOVATION in gas range manufacture is the new In-A-Drawer broiler which the Buck's Stove & Range Company has added to its line of gas ranges during the year of 1928.

Mechanical features of this innovation consist of a drawer, on sliding portable arms, that operates as the drawer of a filing cabinet. This new convenience enables the individual operating the stove to broil food in the ordinary manner and after it is completed, to pull the drawer out, full length from the range, and have the pan full of broiling food at an accessible position for transfer to a table platter. Chance of burning the hands is lessened by the new feature.

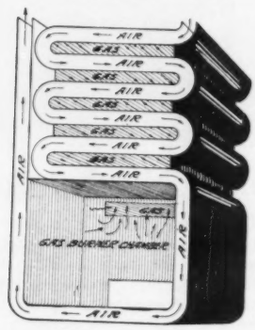
Reynolds Loading Device

THE loading device placed on the market by the Reynolds Gas Regulator Company automatically loads the pressure according to demand and unloads when the demand is off. The following are features added in 1928:



1. Can be installed on any Reynolds District Regulator now in use.
2. Requires opening or closing valve to be put in operation or taken out of operation.
3. Builds up the pressure as required by demand.
4. Has adjustable feature.
5. Loads to predetermined pressure.
6. Covers range of increase pressure, 3 inch to 14 inch W.C.
7. Will operate on a build up of .6 inches W.C.

Hot-Kold System Adds New Features

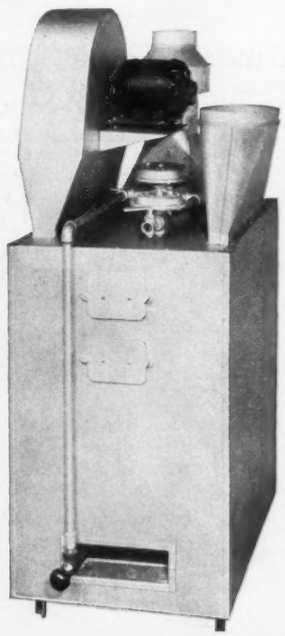


Sectional View, Hot-Kold Furnace

THE furnace manufactured under the trade name "Hot-Kold" by The General Iron Works Company has new features incorporated in the 1928 line.

Production is confined at present to Hot-Kold model B-4-12. The unit is automatic.

A new operating feature is partial dehydration of the burned gases while venting these gases well above the dew point. The latent heat of this H_2O vapor is thus made available and the condensate secured is filtered, purified, and used to humidify the conditioned air.



Chromium (stainless) steel is used in the construction of the new unit of the Hot-Kold system.

Type D Electric Motor

THE new Type D Electric Motor, manufactured by the Minneapolis-Honeywell Regulator Company is constructed for operation on 110 volt, 60 cycle current but motors can be furnished for 110 and 220—40, 50, and 60 cycle A.C., 110 and 220—25 and 30 cycle A.C. and 110 and 220 volt D.C. Standard timing is 30 seconds per operation, which means one-half revolution of the crank

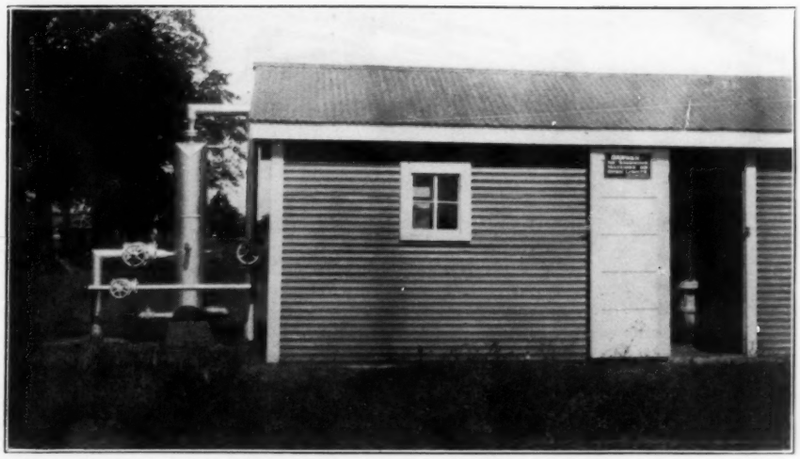
arm. Other periods of operation may be furnished on special orders, namely multiples of 30 seconds up to 270 seconds. On artificial gas applications it is recommended that a snap acting lever-type valve be used rather than a balanced lever type.

Chambers Autostat

CHAMBERS Manufacturing Company announced to the trade during the summer months a new oven heat regulator which regulates the heat and also shuts off the gas at the desired time as well. The Autostat, as the new mechanical gas control and shut-off device is called, was designed by J. E. Chambers, of the company. It consists of a small attachment built into the side of the oven, and a small knob on which is fixed a metal arrow which automatically turns off the gas in the oven, and permits the cooking to continue with retained heat. A chart, with which the range is equipped, shows the food listed in proper columns in certain zones. The arrow is pointed to the kind of food which is going into the oven and after the proper amount

of heat for the cooking of that kind of food is stored up, the Autostart turns off the gas, but the food keeps on cooking with the retained heat.

The Thermodome, which works in connection with the Autostart, is an insulated dome under which vegetables are cooked with retained heat.



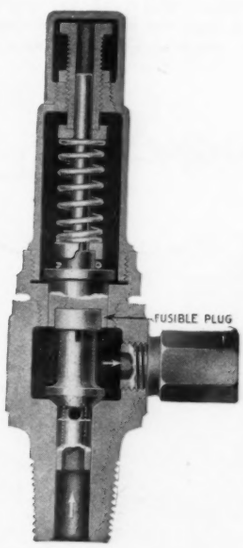
Acme Gas Cleaner *for* Natural Gas

THE Acme Gas Cleaner, a new product of the Acme Gas Cleaner Company, has been developed for removing fine dust and other foreign matter from natural gas. Gas enters the lower chamber where it is blown down into oil through nozzles designed for the device. The resultant agitation brings the gas in contact with the oil, thus wetting the dust in the gas. The dust will cling to the oil. The gas is then passed into the upper chamber where the oil is separated by centrifugal force and wetting. It is then passed at low velocity through a condensing device on the outlet which drops out mechanical oil haze remaining in the gas. A gauge glass indicates oil level and condition of oil.

The dirty oil can be drained and replaced while the cleaner is in service, the dirt then being settled out and the oil used over again. Mineral seal oil, crank case drainings, or any cheap oil of about 42 gravity can be used. The device will not remove sulphur. The pressure drop through the cleaner is a few inches of water. All openings in the cleaner are of greater area than that of the entering line.

Lovekin Relief Valve

THE accompanying illustration shows the Lovekin combined Pressure and Temperature Relief Valve, a new product of the Schutte and Koerting Manufacturing Company, for coal, oil or gas fired



domestic water heaters of the storage type. This valve is designed for attachment to the top of the boiler shell or in the hot water delivery pipe on side armheaters. When pressures above normal working limits are set up by expansion of the water, by water hammer or by other causes the valve, acting as a spring safety valve, opens and relieves the pressure. When temperatures higher than those required in ordinary domestic heaters are reached the fusible metal disc or plug interposed between valve and spring softens due to the heat conducted to it from the water through the valve body. As soon as the metal softens the valve opens and the heated water flows out of the boiler. The plug fuses at temperatures around 200 degrees and the boiling point.

New Hoffman Product

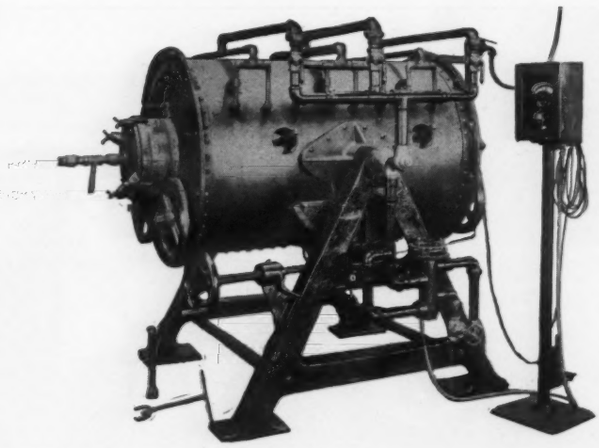
THE principle involved in the Hoffman Unit Volume system of water heating, brought out this year by the Hoffman Heater Company, is new in that it supplies a known quantity of water at a fixed temperature. Peak demands can be calculated and the proper size of apparatus can be selected to supply the demand.

Following are features that are used in the Unit Volume System:

1. Head room is not a factor.
2. Tanks can be vertical or horizontal or in multiple as requirements demand, or additional tank or heater can be added to take care of changed conditions.
3. City water pressure is not a vital factor. As long as cold water will flow, hot water will be supplied at the same head.
4. All connections are of brass and small in diameter.
5. It will increase or decrease its heating capacity.
6. It will remove oxygen set free by heating from the water.

Safety features are as follows:

1. A failure of electric current will shut off fuel until service is resumed.
2. A 30 per cent reduction in water flow will shut off fuel.
3. A slight formation of steam will shut off fuel.
4. A loss of water in the system will shut off fuel.
5. A failure to open water inlet supply valve will shut off fuel.
6. A closed valve in the discharge line will shut off fuel.



Rotary Carburizer Announced *by* Am. Gas Furnace Co.

THESE machines developed by the American Gas Furnace Company are used for the carburization of steel, also for other heat treatments such as hardening, annealing and, when necessary, for bright annealing, in which case a hydrogen atmosphere is maintained in the retort. They are also used for the new nitrogenizing process in which case an anhydrous ammonia atmosphere is maintained in the retort.

All classes of work are carburized in them, as for example, ball and roller bearings, piston pins and similar parts for automobiles; set screws, bolts; silent chains, roller chains and skid chains; sewing machine, typewriter and adding machine parts.

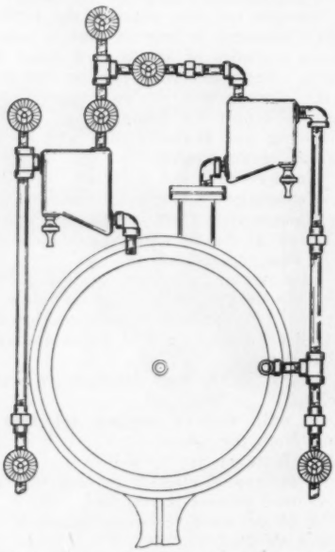
Four and one half inches of insulation is provided between the refractory lining and the outer steel shell. Timken Roller Bearings are used in the support rolls and the A-G-F improved venturi injector is used to insure an accurate air to gas ratio over a wide range of turndown. Burners are so graduated so as to secure uniform heating from the front to the back of the retort. Rotation of the retort insures uniform heating Machines are supplied in various sizes up to 1200 pounds capacity per charge.

Perfection Duplex Trap

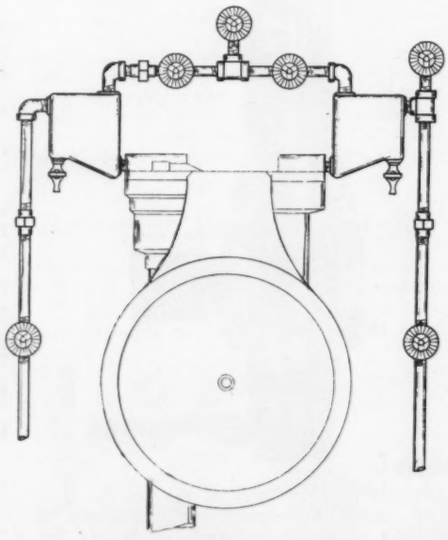
PLACED on the market during the past year by the Natural Gas Equipment Company, the Perfection Duplex Trap is for use with orifice meter gauges. It will return to the gauge mercury blown out by excess differential pressure. The mercury will rise in the trap, breaking the seal and relieving the pressure, allowing the gas to be by-passed. The mercury will be returned to the gauge by gravity when operating conditions become normal.

The Perfection Duplex Trap will prevent fluids such as water, gasoline, crude oil, dirt, scale and other foreign matter from being carried into the gauge. The use of many small fittings has been eliminated, standard fittings being employed for making connections to gauge, and there are no working parts. Fluid may be expelled without shutting off the gauge. The traps may be used in measuring gas, air, heading wells, fuel to drilling rigs, steam, water, light and heavy oils at either high or low pressure. These traps have been found especially adaptable to use with meters in gas lift service.

Dimensions of the trap are 2 inches by 4 inches by 6 inches, each trap weighing 4¼ pounds. They are made for pressures up to 1000 pounds.



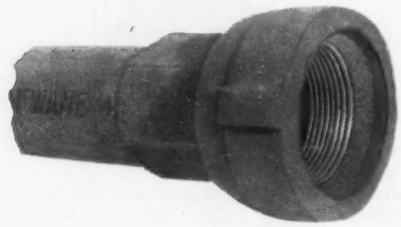
Application to Foxboro Gauge, Type C



Application to Westcott Gauge, Type D

New McWane Pipe

A NEW type of McWane cast iron pipe in standard lengths equipped with a special type of threaded joint has been developed by the McWane Cast Iron Pipe Company. The new pipe is made in sizes from 2 to 6 inches inclusive, and is for gas pressure up to 100 pounds.



The bell end of each pipe length is thickened to compensate for the cutting of threads; then a female standard iron pipe thread is cut in the inner surface of the bell. On each spigot end a male thread is cut. Laying the pipe is a matter of applying a coating of joint compound and screwing the spigot into the bell until a gas-tight joint is attained. The threads, due to thickening of the pipe ends with additional iron, are the next size larger than the pipe itself. Thus a 4-inch pipe has a 5-inch thread, etc.

New Cleveland Co. Burner

THE Cleveland Gas Burner and Appliance Company announce that the new Barbar automatic gas burner will be placed on the market immediately.

The Barber automatic burner is equipped with the following:

Gas pressure regulators.
Automatic safety pilot.
Jet pilot for each burner unit.
Automatic electric gas valve.
Form fitting and adjustable baffles for baffling the circulation of air in the combustion chamber.
A gas distributor header, providing distribution of gas to all units of the burner.
Manifold, providing capacity for all the burner units.
Arrangement which permits units on each burner assembly to be contracted or spread so as to meet the requirements of the firebox.
Automatic draft door regulator, to control the entrainment of secondary air.
Automatic room thermostat or temperature control.

The burner is supported by two pedestals equipped with adjustable stanchions.

There will be three standard sizes of the Barbar automatic gas burner for round furnaces and boilers with grate diameter from 18-inch to 32-inch. Each type or size will be adjustable without change of parts or fittings, to fit the range or grate diameter for which each burned is specified.

Gas-Conversion Burner

THHe Ideal Gas-Conversion Burner of the Moto-Gas Machine Company redesigned in 1928, consists of a steel frame set on the grates of a coal furnace. This supports the burner-head which consists of a gas manifold into the sides of which are screwed the nipples, in each of which are drilled 20 gas ports. The larger burners have 36 nipples. Channels fastened to the nipples support steel racks on which rest the fire-clay radiants which cover the whole area of the burner. All metal parts of the burner are made of chrome alloy which are constructed to withstand a temperature of 2000 degrees F. There are 8 pilot flames the extinguishment of which is prevented by a draft-hood.

In the preheater box or economizer both gas and air are preheated before being mixed and passed on to the burner. Next there is the motor-driven blower to force the gas and air into the burner in volumes to insure combustion.

In the preacher box or economizer wherein control of a clock-thermostat. The pilot lights are converted into "safety-pilots" through the use of a "stackstat", and excessive heat and low-water in the boiler are controlled by the action of a "masterstat". The thermostat automatically actuates an electric gas valve which turns on or shuts off the gas from the burner, and the gas valve is independently actuated by the "stackstat" and the "masterstat."

Majestic Hotel Range

THE Majestic SuperService Single Unit Gas Range, a product of the Majestic Manufacturing Company, has several improvements incorporated during the past year.

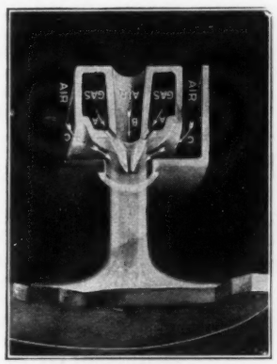


Figure 1

Figure 1 shows a part of the Dual-Control Thermajestic Burner (one group of ports) which arrangement of baffle plates directs heat to the 36x36-inch smooth polished cooking top. Primary air mixed with gas through venturi tubes is forced through port openings (A) drawing a volume of secondary air at inside and outside of flame (B and C).

Figure 2

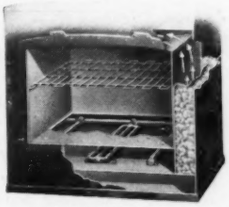


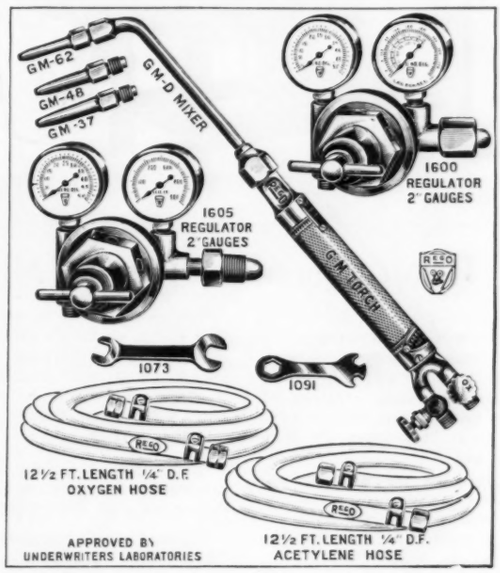
Figure 3

Second illustration shows entire burner with cover plate lifted.

Third illustration shows heat circulation through flue around oven. No direct heat or gases from burner enters oven; 1½-inch rockwool insulation between flue and range body.

The manifold is now in front so that as many units as desired can be hooked up together.

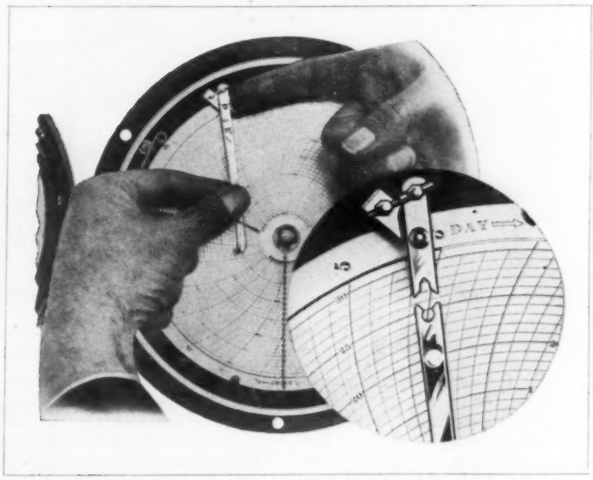
Rego Leader Outfit Placed *on* Market



THE "Rego Leader Outfit" placed on the market by the Bastian Blessing Company, is designed to meet the needs of steam fitters, pipe welders, large garages, welding shops and industrial plants. The torch is made of forgings and non-bending tubing. The pointed cone tips which are furnished with the torch give a long pointed cone. The forged regulators are made of forgings. They have a forged body with a large expansion champer. The forged yoke insures that seat and nozzle will be in line. The bonnet and back cap are also forged. The entire regulator can be taken apart and put together again without the use of heat or special tools.

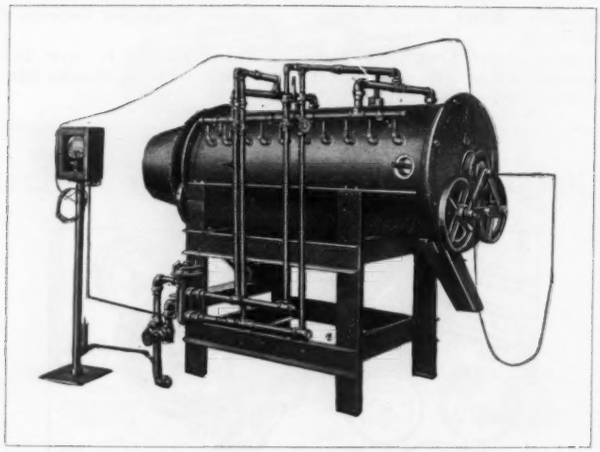
The Rego Leader Outfit is a base outfit and contains the items required to put in a welding installation: The GM torch with three GMP copper welding tips, two 2⅝ forged body regulators with 2 inch gauges, two 12½ feet lengths, ¼ inch D. F. corrugated woven high pressure hose, a torch wrench and a regulator wrench.

Foxboro Recording Device



THE latest improvement in Foxboro Recording Instruments is the patented, detachable pen arm with open end. It can be replaced if bent or broken. The insert shows the construction of this pen arm and how it can be slipped into place.

The lower end of the pen arm is open to facilitate the removal, cleaning and inking of the pen and to keep the pen arm clean.



Rotary Retort Continuous Heating Machines

THIS machine is designed by the American Gas Furnace Company especially for the continuous hardening, annealing of tempering of uniform parts in quantity. It is suited for the heat treating of small and medium sized bolts, cap screws, set screws, chain links, all types of pins, pressed metal parts, etc.

The work is fed into the cone shaped hopper in quantity. This hopper is equipped on its inner periphery with scoops whose capacity to deliver to a central chute leading into the heating chamber is adjustable by the small hand wheels shown on the outside. The feed is practically continuous and measured. The rotating retort into which the work is fed is provided with a spiral which advances the parts to the point of discharge. The spiral or fin on the inner surface of the retort is some distance from the discharge end of the retort leaving a section of plain cylinder which acts as an equalizer to provide a uniform discharge from the retort into the quench.

The machine is provided with a heavy refractory lining, backed by insulation and the retort is of heat resisting alloy.

Burners are arranged in sections so that the desired heating cycle may be obtained. Temperature may be controlled automatically. Individual motor drive with Reeves variable speed transmission gives control of the heating cycle.

Blodgett Commercial Gas Oven Introduced

HERE are the features of the new Blodgett 422-G Oven, shown above. It is designed especially for pie, cookie and layer cake baking, as well as for deep pan roasting of meats or beans. Its capacity is 2-8 sheet pans, 9-36 two-crust 10-inch pies, 9-18 custard pies, 36 one and one-half pound loaves of bread and 8 bean crocks of 11-quart capacity.

The 422-G oven is constructed from heavy gauge sheet iron, with 2 inches of aircell asbestos insulation. The door fits snugly and is easily removed, and is insulated with one and one-half inches of aircell asbestos. The gas burners in this oven consume approximately 30 cubic feet of gas each hour.

Two models are placed on the market—the Standard and the Special. The Standard is finished in galvanized iron and has two shelves; the Special is finished in black japan enamel, and is equipped with four shelves.

J. A. BELL NAMED SALES MANAGER OF KANSAS COMPANY

J. A. Bell has been appointed general sales supervisor of the Kansas Pipe Line and Gas Company, a subsidiary of the North American Power & Light Company. He was formerly assistant new business manager of the Capital Gas and Electric Company at Topeka, a Doherty company.

The Kansas Pipe Line & Gas Company serves gas to McPherson, Lindsborg, Abilene, Salina, Junction City, Manhattan and other Kansas towns in that section.

WEAVER L. MARSTON IS CALIF. MGR. FOR SHARPLES CO.

The Sharples Specialty Company announces the appointment of Weaver L. Marston to fill the vacancy of the late L. A. Taylor as general manager for the company in California. Mr. Marston was formerly assistant sales manager for the Sharples Company at headquarters office in Philadelphia. J. M. Wilcox continues as Southern California manager for the company.

L. A. G. AND E. CORP. STARTS WORK ON DIST. OFFICE

Work has started on the Alhambra district office of the Los Angeles Gas and Electric Corporation. Approximately $135,000 will be expended on the building, which is of brick and terra cotta construction. The first floor will house the various customer service windows, cashier cages, and other officers. The second floor will be given over to employees lunch and rest rooms, a demonstration room, and an addressograph department.

FRANCE PACKING COMPANY ISSUES NEW FOLDER

Under the title "Pictorial News," the France Packing Company, Tacony, Philadelphia, Pa., has issued two rotogravure sheets showing some installations under unusual conditions on different types of engines and compressors. They have also issued a folder entitled "What Is the Life of Metallic Packing?"

C. V. ALLEN NAMED MANAGER OF TEXAS CITIES CO.

C. V. Allen of Houston, former general agent of the Houston Natural Gas Company, has been appointed manager of the Texas Cities Gas Company at Waco, succeeding C. M. Thompson, who died recently. Prior to his service with the Houston Natural Gas Company, Mr. Allen had also been with the Lone Star Gas Company and the Fort Worth Gas Company.

HOUSTON GULF GAS CO. MAY SERVE MONTERREY, MEX.

According to press reports, the rights of way for the Houston Gulf Gas Company's 12-inch line to extend from the Jennings field in Zapata County, Texas, to Monterrey, Mexico, are now being secured. The line will be approximately 140 miles in length and will supply gas to the smelters at Monterrey.

CARLSBAD, N. M., WILL HAVE NATURAL GAS

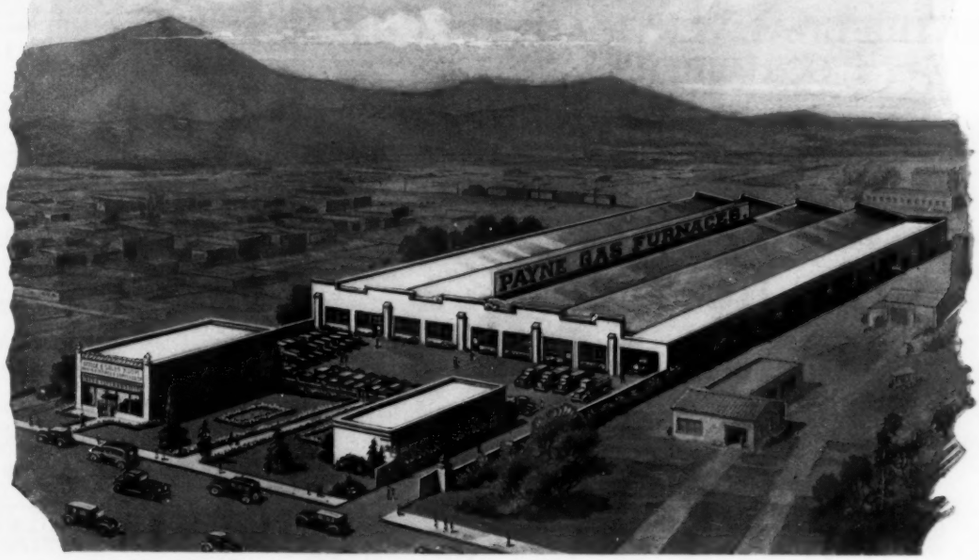
Carlsbad, New Mexico, will soon be supplied natural gas through a line being constructed to that place from the Phillips Petroleum Company plant at Artesia, New Mexico, by the Pecos Valley Gas Company. To augment the supply of residue gas, the company is drilling another gas well in the Vandagriff permit.

Where

Payne Gas Furnaces

Are Built

IN THIS splendid plant modern labor saving machinery provides ideal working conditions for the men who build ***Payne Gas Furnaces*** just as their handiwork emancipates the home owner from the drudgery and inefficiency of old-fashioned heating methods



In this factory have been developed advanced standards of heating equipment which have revolutionized the industry.

Payne Furnace and Supply Co., Inc.

Main Office and Factory

OAKLAND BEVERLY HILLS, CALIFORNIA PASADENA

The
BARTLETT HAYWARD CO.
Engineers and Founders
BALTIMORE NEW YORK

DESIGNERS AND BUILDERS
OF
COMPLETE COAL GAS PLANTS

CARBURETTED WATER GAS PLANTS

BY-PRODUCT PLANTS

DE BROUWER CHARGING AND
DISCHARGING MACHINES

SALT WATER AND FRESH WATER
CONDENSERS

PURIFIERS

SHAVING SCRUBBERS

CENTRIFUGAL VERTICAL TYPE
SCRUBBERS

STEEL TANKS

VERTICAL WASTE HEAT BOILERS

GAS HOLDERS

J. B. McMAHON IS NAMED MANAGER FOR FOXBORO COMPANY

J. B. McMahon, formerly in charge of the district office at Dallas, Texas, of the Foxboro Company, has been appointed Mid-Continent manager for the company with headquarters at Tulsa, Oklahoma.. C. O. Bryan, who has been associated with Mr. McMahon in the Dallas territory, has been named manager of that office.

ELROY PAYNE WILL ATTEND A. G. A. COMMITTEE MEETING IN DENVER

Elroy Payne, of the Payne Furnace and Supply Company of Los Angeles, will leave on December 9 for Denver, Colorado, to attend the meeting of the Central House-heating Committee of the American Gas Association, in conference in that city on December 11.

NATURAL GAS IS A FACTOR IN AIRPLANE MANUFACTURE

Natural gas is making its contribution to the development of the nation's aircraft industry. Three plane manufacturing plants at Wichita, Kansas, are now using natural gas for industrial and heating purposes, according to officials of the Cities Service Gas Company. The plants are those of the Swallow Airplane Company, the Travel Air Manufacturing Company and the Spearman Aircraft corporation. Service to these plants is being maintained from the main lines of the Cities Service Gas Company.

LOMPOC, CALIF., RATES FIXED BY STATE COMMISSION

Rates for gas at Lompoc, California, have been fixed at $1.35 per 1,000 cubic feet, by the California State Railroad Commission.

S. W. Meals

H. C. Morris

Southwest Natural Gas Dept. *to* Convene

THE Southwest Division of the Natural Gas Department of the American Gas Association will hold its annual convention on January 14th and 15th at Shreveport, Louisiana. N. C. McGowen, member of the Advisory Committee of the department, is chairman of arrangements for the convention, and H. C. Morris of Dallas, vice chairman of the department, will preside.

Wm. C. Grant

N. C. McGowen

The tentative program arranged for the convention includes the following papers:

"Open Flow by Pressure Method."

"Proper Casing of Wells."

"Maximum Economic Pressure Limits for Which Long Distance Lines Can Be Designed."

"Ideal Distribution Systems for Communities of 250 to 1500 Meters."

"Proper Classifications of Accounts for Natural Gas Producing Pipe Line and Distributing Companies."

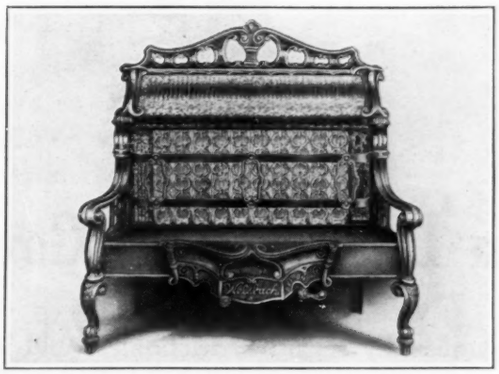
"Gas Company Advertising."

"Domestic Advantages of Natural Gas."

Discussion will be called for following the reading of each paper. A portion of each afternoon of the two-day session will probably be given over to a question box, the questions for discussion to be assigned by the committee on papers.

MONTANA-DAKOTA POWER CO. PLANS DEVELOPMENTS

Montana Dakota Power Company, which has sponsored extensive gas development in Montana and Dakota, is planning large natural gas developments for the coming year. The Black Hills line, the big activity of the company year, was completed in October. From the natural gas fields near Baker, a main line 175 miles in length was constructed, supplying gas to the Hills territory. During the summer months the company built 440 miles of distribution mains. A project now under discussion is a gas line into Bismark and Fargo, North Dakota. Fargo is about 350 miles from the gas fields.



Speeding up the Winter Selling Program with *Welsbach*

RADIANT HEATERS. The growing number of Commercial Managers now choosing Welsbach as the basis for active selling campaigns is worthy of special notice.

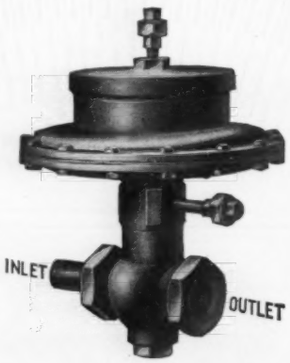
A line of radiant heaters whose radiance is further enhanced by the value of the name Welsbach. They constitute a line of popularly designed models of modest price with real beauty of form and finish. Originality of design is one of the strongest factors in making a sale. And then, too, there's the name Welsbach—always of value to seller and buyer.

WATER HEATERS. Construction and favorable price combined come first. With the Welsbach experience behind design and production a Company knows it can rely on the product absolutely. And the lustre of the best-known name in gas appliance manufacture is a selling point of definite sales-closing value to the man who must get the signature on the dotted line.

Member of American Gas Association
Member of Pacific Gas Association

WELSBACH COMPANY

San Francisco Office
863-865 Mission Street



Fulton Dead Weight Governor

An unusually sensitive, frictionless and long-lasting governor to be used either as a direct governor, or for individual service. Maintains a uniform pressure throughout the entire range of flow.

WRITE for the Chaplin-Fulton 60-page catalog. It's free and contains data on our many time-tested and proven gas regulators that you will find invaluable in your work.

The Chaplin-Fulton Mfg. Co.

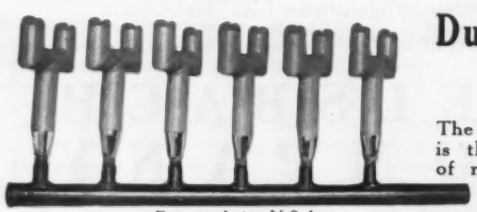
Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in all Sizes From 1 Inch to 24 Inches; For All Service. 1 oz. up to 1,600 lbs. Pressure to Square Inch.

28-40 Penn Avenue **Pittsburgh, Pa.**

REPRESENTATIVES:

WESTCOTT & GREIS, Inc.
Sales and Service
Dallas — Los Angeles — Tulsa

JNO. W. CRAWFORD
Sales Engineer
1855 Industrial Street Los Angeles



Patented in U.S.A.

Duro Low Pressure Gas Burner

The Duro Low Pressure Gas Burner is the culmination of many days of research, numerous combustion tests and practical trials in the drilling field, and in industries.

Duro flue gas analysis tests show CO2 contents running from 10.5 to 11.5 per cent. Uses minimum gas volume. Simple to install.

Write Us for Information

DURO GAS BURNER, Inc.
228 Atco Bldg. TULSA, OKLA.

Natural Gasoline Assn. *in* Fall Session

FOLLOWING the tentative program as outlined in the November issue of *Western Gas,* the California Natural Gasoline Association met in annual session at the Biltmore Hotel in Los Angeles on November 13 and 14.

President George L. Ratcliffe of the General Petroleum Corporation opened the convention, and his address of welcome was followed by a series of addresses on topics connected with the natural gasoline industry. President Ratcliffe spoke on the progress of the Association during the past year, telling of its growth from 250 to 600 members, with an average attendance of 200 at each monthly meeting.

Committee reports were read into the program and were thoroughly discussed by attending members.

Dr. George Granger Brown, the convention speaker, who came by airplane from the University of Michigan, where he is professor of chemical engineering, spoke on "The Value of Natural Gasoline to the Refiner in Blending Finished Motor Fuels."

The convention closed with a banquet and entertainment for members and visitors, more than 300 being present.

NEW HIGH RECORD OF NATURAL PRODUCTION IN CALIF. FIELDS

During the past weeks a new high record of daily production of natural gas from California fields was announced by Claude C. Brown, gas administrator for the state railroad commission. Most of the record amount of 1,000,000,000 cubic feet is coming from the Los Angeles basin fields and the Ventura area, according to Mr. Brown. Approximately 50,000,000 cubic feet are being reinjected into depleted fields. Field operators are using 500,000,000 cubic feet daily for drilling and refining, while domestic and industrial daily consumption in Southern California is 300,000,000.

In 1927, 1,200,000 California gas users consumed a total of 109,000,000,000 cubic feet of gas, of which 76 per cent was from California fields.

MARTIN J. INSULL ATTENDS MEETING IN DALLAS

Martin J. Insull, of Chicago, attended the regular monthly meeting of the directors of Central and Southwest Utilities Company held in Dallas recently.

Mr. Insull is president of the company, which is the holding company for five public service corporations. They are Southwestern Gas and Electric Company, operating in East Texas; Central Power and Light Company, in South Texas; West Texas Utilities Company, Public Service Company of Oklahoma and the Southwest Light and Power Company, of Western Oklahoma.

LOUISIANA P. & L. MAY SUPPLY LA. TOWNS WITH GAS

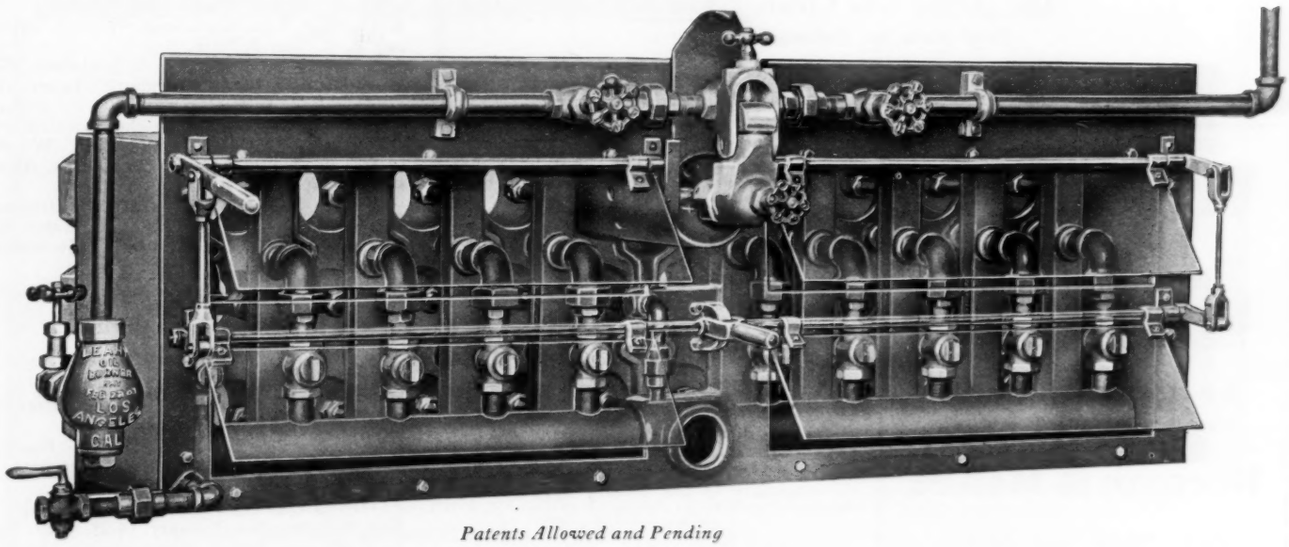
Louisiana Power & Light Company has signed a contract, according to announcement, by which it will receive gas for distribution in Louisiana towns, from the 210-mile pipe line being constructed by the Memphis Natural Gas Company from the Monroe, Louisiana gas field to Memphis. The gas will be supplied to the cities along the right of way in Louisiana. Similar contracts have been signed with the Memphis Natural Gas Company by the Missouri Power & Light Co., and the Arkansas Power & Light Co.

RESULTS OF SERVICE TESTS

On a 150 H.P. Horizontal Return Tubular Boiler

Under Actual Working Conditions
Using Leahy Multi-Jet Unit

55 Hours	**DURATION OF TESTS**	**64 Hours**
184.7	Average Boiler Horsepower Developed	187.4
123%	Average Per Cent of Rating	125%
37.72	**Cu. Ft. of Gas Used Per Boiler Horsepower**	**37.27**
79.25	**Combined Boiler and Burner Efficiency**	**80.13**
	Average Flue Gas Analysis	
10.8	CO_2	10.8
2.4	O_2	2.1
0.0	CO	0.0
1120.0	B. T. U. Value of Gas, Per Cu. Ft.	1121.0
515°F.	Temperature of Stack Gases	505°F
.09	Draft Between Boiler and Damper	.06



Patents Allowed and Pending

View Showing Combination Gas and Oil Unit—Note Separate Controls and Individual Features.
These Units Are Adaptable For

HIGH AND LOW PRESSURE STEAM BOILERS, OIL STILLS, RETORTS, CEMENT, LIME AND ROTARY KILNS, BAKE OVENS, RANGES, KETTLES, ETC.

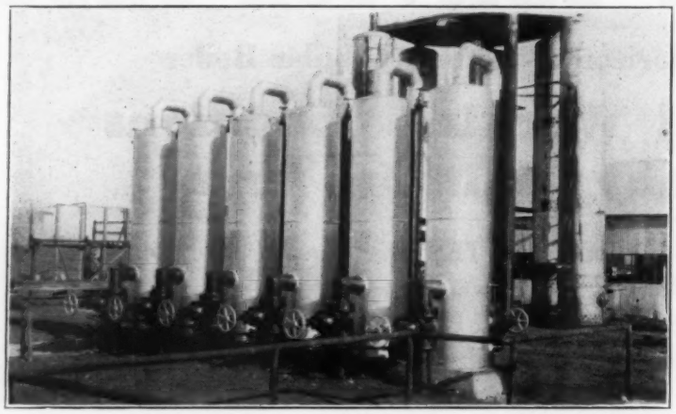
Boiler Economy Depends Upon Burner Efficiency

This Equipment Assures Both

Send for Literature on Gas and Oil Burning Equipment

LEAHY MANUFACTURING CO.

1804-1810 East Eighth St. ESTABLISHED 1902 **Los Angeles, Calif.**



Battery of six 36" Acme Gas Cleaners Capacity 150 Million Per Day At 200 Pounds

Acme Gas Cleaners

Completely, Efficiently, Economically, Remove the *Finest Dust,* Sand, Water, Oil and Other Foreign Matter from Gas by Oil Contact Method. Used by the Largest Gas Companies. Recommended by Meter, Regulator and Compressor Manufacturers.

—Write Us About Your Dust Problems—

The Acme Gas Cleaner Co.

3406 Main St., Dallas, Texas

Announcing

The Consolidation of the Oxide Business of

Arthur R. Maas

—and—

Norman R. McKee

Both Maas and McKee Oxide are now being produced in our new plant at Southgate. Improved and larger facilities will enable us to better serve our patrons with the same high standard of quality for which the names "Maas" and "McKee" have stood.

California Oxide Co.

308 East Eighth Street

Los Angeles

Phone: TRinity 0769

H. S. BEAN ON COAST IN MEASUREMENT PROJECT

H. S. Bean of the United States Bureau of Standards, who is directing the work of the American Gas measurements committee, is now in Southern California completing some phases of this extensive research undertaking.

SUPERIOR OIL COMPANY BUYS ADAMS GASOLINE PLANT

The gasoline plant of the Moody Corporation northwest of Cisco, Texas, has been purchased by the Superior Oil Corporation. The plant was operated under the name of the Adams Gasoline Company, a subsidiary of the Moody Corporation.

NEW CHEMICAL SOCIETY IS ORGANIZED IN NOVEMBER

Organization of the Association of Consulting Chemists and Chemical Engineers at a meeting held in the Chemists' Club of New York City in November, is announced.

Constitution and By-Laws were adopted and the following officers were elected: President, Hal T. Beans of Columbia University; vice-president, Irving Hochstadter of Hochstadter Laboratories; secretary, Clarence V. Ekroth of Ekroth Laboratories, 461 Eighth Avenue, New York City; and treasurer, Jerome Alexander. The following were elected directors: Charles V. Bacon, Frank C. Gephart, Robert Schwarz of Schwarz Laboratories, Albert M. Smoot of Ledoux & Co., Albert G. Stillwell of Stillwell Laboratories, Arthur W. Thomas of Columbia University, John Morris Weiss, of Weiss & Downs and Thomas A. Wright of Lucius Pitkin.

Rocky Mountain Oil *and* Gas Men Convene

GREAT FALLS, Montana, was the scene of the Rocky Mountain Oil and Gas Association's annual convention on November 23 and 24. Headquarters were in the Rainbow Hotel, where many of the meetings were held.

Men of the industry and authorities on business in general were featured on the program for the two day session. Dr. Stanley L. Krebs of New York gave two addresses on business subjects. H. N. Tolles, president of the Sheldon school in Chicago, also addressed the convention on topics of general interest.

Various technical problems were discussed by men whose word carries weight in the industry, among whom were D. E. Sibley, chief engineer of the Continental Oil Company; and T. J. Olliffe, traffic manager of the Texas Company of California.

The annual president's message was read by M. C. Henderson.

As an entertainment feature of the concluding business session on the afternoon of the 24th, Captain Tim Healy, an Australian war veteran, described his adventures on his various travels.

Members of the committees in charge of the convention arrangements were as follows:

Program—Walter F. Brittan, secretary of the Association, chairman; F. W. Freeman, H. C. Bretschneider, E. S. Karstedt, LaRue Smith, C. H. Brown, and L. B. O'Neil.

Finance—M. C. Henderson, chairman; E. B. Coolidge, Sam Stephenson, William Grills and F. R. Van dePutte.

Publicity—E. H. Cooney, A. J. Hazlett, W. W. Cheely, D. W. Greenburg, James A. Johnson and A. H. Raymond.

Entertainment—O. I. Deschon, chairman; C. W. Landsrud, A. L. Beckman, W. R. Strain, B. G. Stevenson, E. M. Larsen, Aron Singer and W. E. Burks.

Membership—L. F. Sonntag, chairman; H. B. Chessher, L. R. Hannah, James A. Johnson, W. E. Rice, Grover C. Stevenson and F. S. Francis.

1928-1929 Calendar

Central Househeating Committee of A. G. A.—Denver, Colo., December 11.

Southern California Meter Association—Long Beach, December 28.

Southwest Division Natural Gas Department of A. G. A.—Shreveport, La., Jan. 14, 1929.

American Society for Steel Treating—Los Angeles, January 14-28, 1929.

Western Metals Congress—Los Angeles, January 14-28, 1929.

Western States Metal and Machinery Exposition—Los Angeles, January 14-28, 1929.

Mid-West Industrial Gas Sales Council—Chicago, Jan. 25, 1929.

Advisory Council and Executive Board, A. G. A.—Los Angeles, Feb. 6 and 7, 1929.

Oklahoma Utilities Association—Oklahoma City, March 12, 13, 14, 1929.

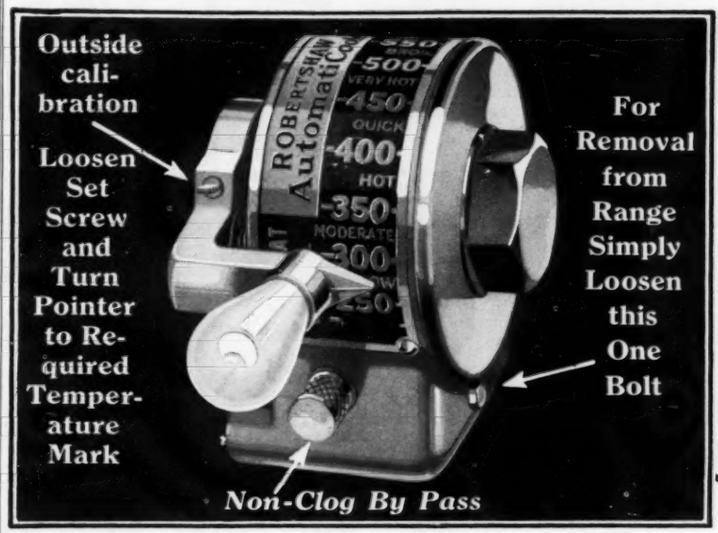
Arizona Utilities Association—Tucson, Ariz., April 18-20, 1929.

Arkansas Utilities Association—Hot Springs, Ark., April 30-May 3, 1929.

Natural Gas Dept. of A. G. A.—Kansas City, May, 1929.

American Gas Association—Atlantic City, October 14-19, 1929.

GAS COMPANIES and STOVE DEALERS



Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

GAS or WATER Connections

whether screw thread or gasket, should be made up with KEY SPECIAL PIPE JOINT COMPOUND.

KEY SPECIAL PIPE JOINT COMPOUND is not a quick hardening cement, but a plastic lubricant and a filler that will seal the most obstinate joint with ease. It covers more surface than an equal volume of red or white lead, thereby reducing the cost. It is waterproof—and there is no waste.

Manufactured by

E. A. Key Co., Inc.

1431 Santa Fe Ave.
Los Angeles, Calif.

Distributors in all principal cities.

WRITE FOR FREE SAMPLE

Mid-West Gas Assn. Offers Eighth Meter Short Course

THE Eighth Annual Meter Short Course being conducted by the Mid-West Gas Association and Engineering Extension Department of the Iowa State College at Ames, Iowa, is scheduled for December 4 to 7 this year. Lectures and demonstrations on meter repairing and testing and shop practice will have their usual importance in the Short Course curriculum, and the gas plant, distribution, house-heating, and relating features are given a prominent place in the year's program.

The course is open to all interested and is attended by executive and practical metermen alike, having become an established event in the calendar of the year.

Following is the program:

TUESDAY, DECEMBER 4, 1928

8:00-11:00 a.m. Registration: Room 105, Engineering Hall.
11:00 a.m. Address of Welcome: Prof. D. C. Faber, Director Engineering Extension Department Iowa State College. Outline of Course: Mr. R. L. Klar, Engineer, Des Moines Gas Co., Des Moines, Iowa.
11:30 a.m. Luncheon.
1:00 p.m. Sections A and B. Lecture: Mr. George A. Lane, Supt. of Meters, Peoples Gas Light and Coke Co., Chicago, Ill.
2:15 p.m. Section A—"Shop Practice." Section B—"Metering Industrial Gas," Mr. A. C. Rathkey, Iowa Public Service Co., Waterloo, Iowa.
3:30 p.m. Section B—"Use of Power Machinery in Distribution Work." The Barber Green Company and other manufacturers will present this subject. Adjournment. Evening program to be announced.

WEDNESDAY, DECEMBER 5, 1928

9:00 a.m. Sections A and B. Lecture: Mr. George A. Lane.
10:15 a.m. Sections A and B. Lecture: Mr. E. J. Werthman, Meter Shop Foreman, Peoples Light Company, Davenport, Iowa.
11:30 a.m. Luncheon.
1:00 p.m. Section A—"Shop Practice." Section B—"Effect of Bad Purification on the Distribution System," Mr. Ray Schacht, Iowa-Nebraska Power & Light Co., Lincoln, Neb.
3:00 p.m. Section B—"House Governors," Mr. A. D. MacLean, Pittsburgh Equitable Meter Co., Pittsburgh, Pa.
5:00 p.m. Adjournment.
Evening program to be announced.

THURSDAY, DECEMBER 6, 1928

9:00 a..m Sections A and B. Lecture, Mr. George Lane.
10:15 a.m. Section A—"Shop Practice." Section B—"House Heating and Its Effect on Plant and Distribution System Investments," Mr. J. A. Farber, The Peoples Gas Light & Coke Co., Chicago, Ill.
11:30 a.m. Luncheon.
1:00 p.m. Section A—"Shop Practice." Section B—"Pipe Corrosion," Mr. A. H. Abbott, Northern States Power Co., St. Paul, Minn.
3:00 p.m. Section B—"Gas Condensers," Mr. J. M. Drabelle, Iowa Railway & Light Co., Cedar Rapids, Iowa.
5:00 p.m. Adjournment.
6:30 p.m. Banquet. Mr. J. H. Ainsworth, Managing Director, Manager, Iowa Railway and Light Corp., Ames, Iowa.

FRIDAY, DECEMBER 7, 1928

9:00 a.m. Section A—"Shop Practice." Section B—"Most Economical Percentage of Blow Run to be Used," Mr. C. C. Barr,

WITH US, *QUALITY* IS NOT AN EMPTY AND CONVENIENT WORD . . . BUT THE VERY BACKBONE OF EVERY INGREDIENT AND OPERATION THAT ENTERS INTO THE MANUFACTURE OF PAINTS AND PROTECTIVE PRODUCTS THAT BEAR THE NAME *ARCO* . . . YOUR ASSURANCE OF LASTING PROTECTION AND COMPLETE SATISFACTION.

THE ARCO COMPANY
CLEVELAND, OHIO

Pacific Coast Branch
116 New Montgomery St.
San Francisco, Calif.

Branches and Warehouses in Principal Cities

(200)

ARCO

Paints . Varnishes . Enamels . Lacquers

It's the new ROPER Auto-Slide Broiler Range

—a sure-fire sales-winner because of its particular advantage to every housewife. Notice, in the picture, how this new Roper Broiler automatically rolls the Broiler Rack and Pan out of the lower oven when the door is opened—simplifies cooking—places the Broiler Pan where the meat or toast can be turned easily—without danger of burned hands or arms.

Cash in on Roper Features

Think of the advantages you'll have with this new Roper Gas Range! The Roper Auto-Slide Broiler, Ventilated Oven, Complete Oven Control, the beautiful white porcelain base band, invisible bolts, hinges and door catches, porcelain enamel oven linings, oven door cooking chart—all these features appeal to your customers. Make the Roper Auto-Slide Range a real source of profit for you.

GEO. D. ROPER CORPORATION
Rockford, Ill.

ROPER
TRADE MARK

GAS RANGES

Radiant Heaters—Gas-Fired Furnaces

TAKE ADVANTAGE

of Roper's Radio Broadcast

This unique broadcasting program is being conducted by the Forecast School of Cookery—an internationally recognized authority on cooking. The Broadcasts are given over the blue network, three times a week for a period of seven months. 51,000,000 people live in the territory covered by this broadcast. The joy of home cooking is being sold to the housewife. The story of cooking is being told from a new angle—the health angle. Play up this cooking school program in your newspaper advertising and cash in on the benefits it will bring you. It is selling gas as the proper cooking fuel. It is Roper's contribution to the cause of gas.

BE SURE THE ROPER PURPLE LINE ═══ AND THE ROPER COMPLETE OVEN CONTROL ARE ON THE GAS RANGE YOU SELL

Stockton Fire Brick Company

FIRE BRICK, INSULATING BRICK
HIGH TEMPERATURE CEMENT

High Grade Refractories
for

GENERATOR LININGS
CHECKERS
BOILER SETTINGS

OFFICE:
Russ Building,
San Francisco

WORKS:
Stockton,
California

Stauffer's

FERROX

Purifier

meets these essential requirements of a good Gas Purifier

A highly active Iron precipitate, with a high Iron content.
A thoroughly impregnated and porous bulky mass, ready to use, no delay, always uniform.

A dependable source of supply

Pioneer manufacturers of Industrial Chemicals on the Pacific Coast

Stauffer Chemical Company

624-638 California Street, San Francisco, California

Des Moines Gas Company, Des Moines, Iowa.
10:15 a.m. Section B—Round Table discussion, "Soft Coal Generator Fuel," "Dehydration of Tar," "Control of Side Wall Clinker in Water Gas Sets."
11:30 a.m. Luncheon.
1:00 p.m. Sections A and B—"Use of Commercial Butane as Enricher for Gas," Mr. W. J. Wuestenfeld, Peoples Light Company, Davenport, Iowa.
3:00 to 5:00 p.m. Program to be announced. Adjournment.

OFFICERS AND COUNCIL
MID-WEST GAS ASSOCIATION
1928-1929

H. R. Sterrett, Ardmore, Pa., president.
Louis Stein, Minneapolis, Minn, first vice-president.
E. H. Vieregg, Grand Island, Neb., second vice-president.
A. W. Schmitt, Des Moines, Iowa, secretary-treasurer.
H. R. Stephenson, Des Moines, Iowa.
F. C. Hoffman, St. Paul, Minn.
H. J. Butler, Council Bluffs, Iowa.
L. W. Wade, Fort Dodge, Iowa.
C. C. Hellmers, Lincoln, Neb.
W. E. Derwent, Rockford, Ill.

COMMITTEE FOR THE EIGHTH GAS METER SHORT COURSE

R. L. Kiar, Des Moines, Iowa, chairman.
Georoge A. Lane, Chicago, Ill.
D. C. Faber, Iowa State College, Ames, Iowa.
V. L. Hein, Iowa State College, Ames, Iowa.
A. T. Barrett, American Meter Co., Chicago, Ill.
E. C. Falvey, Sprague Meter Co., Davenport, Iowa.
R. F. Galpin, Muscatine, Iowa.
E. L. Fischer, Davenport, Iowa.
O. M. Hoxie, Mankato, Minn.

LINE TO WASKOM, TEXAS, STARTED

Construction work has been started on the Moody-Seagraves gas line to extend from the Richland and Monroe gas fields to Waskom, Texas, where it will connect with the 22-inch gas line of the Dixie Gulf Gas Company, a Moody-Seagraves subsidiary, delivering gas to Houston and Port Arthur.

From Richland to Monroe, a distance of 24 miles, 16-inch pipe will be laid, with 20-inch pipe being used for the remaining distance of 112 miles from Monroe to Waskom. The gas pressure at the wells will be sufficient to carry the gas the entire distance.

The line is being constructed to increase the potential gas supply into eastern and southern Texas. When this line is completed the Moody-Seagraves system will connect with seven fields in the Shreveport area.

DR. KARL BUNTE ATTENDS PITTSBURG CONFERENCE

Dr. Karl Bunte, director of the German Gas Institute laboratory at Karlsruhe, Würtemburg, Germany, is a visitor in the United States. Herr Bunte came to this country primarily for the purpose of delivering a paper on "A Method for the Determination of Melting Processes in Ash," before the International Conference on Bituminous Coal at Pittsburg late in November. While in the United States Herr Bunte will visit various gas companies.

ARKANSAS NATURAL PLANS EXTENSIVE WORK

Arkansas Natural Gas Corporation has announced two gas line projects, the contract for one of which has already been let, and the right of way for the other is being purchased.

Booth and Flinn of Pittsburgh have been awarded the contract for a 12¾-inch welded pipe line from El Dorado, Arkansas, to Emmett, which will connect at that point with the Arkansas Natural's Caddo to Little Rock line. This line will be approximately 60 miles in length and will take gas from the Champagnolle field.

The other line will extend from Mooringsport to the Monroe and Richland gas fields via Cotton Valley, a distance of approximately 125 miles. Plans call for a 20-inch welded line which will connect at Mooringsport with the Caddo-Little Rock line. The two projects will be completed at a cost of approximately $1,750,000. Compressor stations will not be built since the well pressures are sufficient to carry the gas to the two junction points.

The completion of these lines together with the line from Clarksville to Little Rock will give the company a connecting system which will supply gas to its patrons from almost all of the available sources in the territory.

TEXAS CITIES GAS CO. WILL SUPPLY NATURAL TO EL PASO

The Texas Cities Gas Company, distributors of artificial gas in El Paso, Texas, has been granted a franchise for the distribution of natural gas in that city by the City Council. A mean basic rate of $1.02 per 1,000 feet will be charged by the distributors, who will pay the El Paso Gas Utilities Company 34 cents per 1,000 feet for gas delivered to its mains.

According to Raymond C. Hill, Los Angeles engineer employed by the city, the rate is based on an investment at the end of three years by the local company of $3,761,000.

According to present plans gas will be delivered to the city through a 200-mile pipe line to be built from the fields in Lea County, New Mexico, or in Winkler County, Texas, at a cost of approximately $3,000,000.

B. C. ELECTRIC CO. OF VANCOUVER HAS NEW SHOW ROOM

The new gas and electric appliance show room for the B. C. Electric Railway Company at Granville and Dunsmuir Streets, Vancouver, was opened late in November.

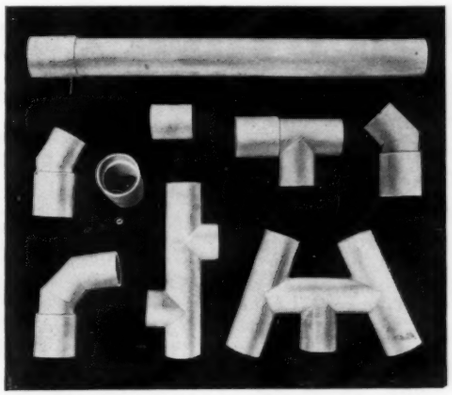
Four floors are devoted to displaying the merchandise of the gas and electric appliance departments. There will be model kitchens, showing both gas and electric ranges, an auditorium where lectures and demonstrations on cooking may be given, a model laundry and a floor devoted to gas heating and labor saving devices.

Peggy Murry, formerly located at the main office, will have charge of the gas sales in the new location.

NEW ELECTROLUX DISTRIBUTORS IN WEST NAMED

H. W. Foulds vice-president of Servel Sales Inc., early in November announced the appointment of several new dealers for Electrolux gas fired refrigerators. Midland Implement Company of Billings, Montana; The New York Oil Company of Caspar, Wyoming; and the El Paso Electric Company of Colorado Springs, Colorado, have been named dealers in their territories.

VITEX



Increases Draft

Improves Combustion

Absolutely Non-Corrosive

The Perfect Gas Vent and Flue Pipe

Samples, prices, and installation information gladly furnished on request

Manufactured by

Plant Rubber & Asbestos Works

537 Brannan Street, San Francisco, Cal.

Chas. C. Moore & Co. Engineers, Inc.

CONTRACTORS FOR COMPLETE PLANTS

High Grade Machinery

The Babcock & Wilcox water tube boilers
Corliss high speed and poppet valve engines
Babcock & Wilcox superheaters
Hamilton compressors
Green fuel economizers
Wheeler Condenser & Engineering Co. condensing machinery
Cochrane feed water heaters (open and closed)
Cochrane feed water metering heaters
Cochrane feed water softeners (hot and cold processes)
Cochrane steam and oil separators
Cochrane flow meters
Moore automatic fuel oil regulators
Diamond soot blowers
Lagonda tube cleaners
Copes feed water regulators
Lagonda automatic boiler stop valves
Leslie reducing valves

And All Power Plant Auxiliaries

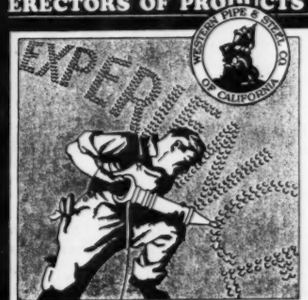
Address our nearest office for catalogs and complete information

Home Office: SAN FRANCISCO, Sheldon Bldg.

New York City, Hudson Terminal Bldg.
Los Angeles, Central Bldg. Portland, Gasco Bldg. Seattle, L. C. Smith Bldg.
Salt Lake City, Kearns Bldg. Honolulu, T. H. Phoenix, Heard Bldg.
Vancouver, B. C., Standard Bank Bldg.

W P & S

DESIGNERS, FABRICATORS & ERECTORS OF PRODUCTS OF STEEL



Investigate WESTERN Hi-Pressure Unit Gas Holders

WESTERN PIPE & STEEL COMPANY OF CALIFORNIA

5717 Santa Fe Ave. LOS ANGELES — 444 Market Street SAN FRANCISCO

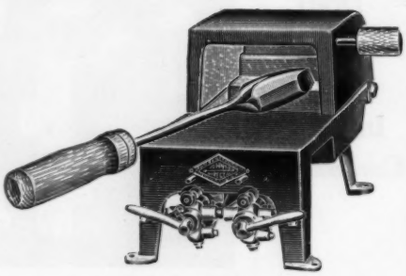
FACTORIES: LOS ANGELES · SOUTH SAN FRANCISCO · FRESNO · PHOENIX · TAFT

W P & S

Exceptional Service Through This Famous

Johnson Bench Furnace

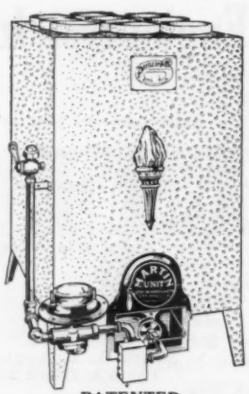
Low initial cost and low operating cost are features which make this efficient bench furnace doubly attractive and desirable. Two powerful burners supply quick, intense heat without use of blower. Will heat soldering coppers up to 12 lbs. per pair. Also used for heat-treating, tempering, annealing, etc. Full details on request.



No. 101 Furnace

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. Babcock Co.
135 Bluxome Street San Francisco, California



PATENTED

Martin Unit Gas Furnaces

ARE THE RESULT OF 38 YEARS HEATING EXPERIENCE
MADE IN FOUR SIZES
Electric, Thermostat or Manual Control
Approved by A. G. A. Laboratory and by the City of Los Angeles
Write for your copy of "Modern Heating Methods"

PHILLIPS HEATING, VENTILATING & MFG. CO.
1710 W. Washington St.
Los Angeles, California

Live Agents Wanted

TESTING LABORATORY A.G.A. APPROVED

SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

B. C. Electric Company Sales Show Gain

RECENT work of the gas sales department of the B. C. Electric Railway Company of Vancouver, B. C., shows a material increase in industrial and domestic installations of gas appliances.

In the domestic field the following installations were made during the month of September: 158 radiant fires, amounting to $6,658; 75 gas ranges, valued at over $5,000; 36 hot plates, 30 water heaters, six automatic water heaters, two radiators, 11 furnaces, and 23 kitchen heaters. Piping, fitting, and similar work done by the company amounted to $5,000 for the month.

In the industrial field salesmen for the company reported the following installations: Dickson Importing Company converted their peanut and coffee roasting machines from hard fuel to gas; Bindons Limited, replaced its oil system with gas; The Swift Canadian Company installed a large gas fired rotary oven for baking meat and hams; the David Spencer Department Store installed two heavy duty gas ranges, replacing coal, in the sixth floor dining room and cafeteria. These ranges have a cooking surface of eight feet by three feet and three large roasting ovens.

The total value of all installations of gas appliances during the month of September amounted to $25,531.29, with an estimated additional revenue of $9,177.00. Corresponding figures for the same month last year show a total of $22,676.77 with an estimated additional revenue of $8,732.00.

"SAFETYGRAM" CARRIES SAFETY MESSAGE TO P. G. AND E.

"The Safetygram" is the title of a quarterly safety bulletin being issued by the Pacific Gas & Electric Company, under the auspices of the Central Safety Committee.

S. C. Dickinson, safety engineer, has charge of the publication. The four-page paper, Volume 1, No. 2 of which will appear in December, contains suggestions for the abolishing of accidents, together with tabulated statistics on the progress of safety work throughout the Pacific Gas & Electric system.

Of the 13 territorial divisions of the Company, Fresno has the most outstanding record in the matter of the elimination of accidents. There have been no injuries resulting in time lost in this division since October, 1926.

Over the whole system, accidents have been reduced 34 per cent during the past year, and over a period of four years, they have been cut 54 per cent.

DOMINION NATURAL GAS CO. MAY BUY ST. THOMAS, ONT., PLANT

The Dominion Natural Gas Company, an Ontario subsidiary of the Cities Service Corporation, has made an offer of $500,000 for the purchase of the municipally owned artificial gas plant at St. Thomas.

Their plans are to supply St. Thomas in part with natural gas from Tilberry field and to supplement this with artificial gas. To this end a coking and by-product plant at Port Stanley is to be erected costing $2,000,000. This will lengthen the life of the natural gas fields in southwestern Ontario three hundred per cent.

OTTAWA-KANSAS CITY LINE NOW COMPLETED

Announcement is made by the Cities Service Gas Company, an Empire subsidiary, of the completion of a third 16-inch natural gas pipeline between Ottawa, Kansas, and Kansas City, Missouri.

This pipeline completes the project, started in 1927, which resulted in connecting western Missouri and northern Kansas directly with the gas reserves in Gray and Carson counties in the Panhandle of Texas by means of a 20-inch natural gas line.

The entire pipeline, including both gathering and main lines, is 450 miles in length and has a dail ydelivery capacity of about 100,000,000 cubic feet. This delivery involves the operation of six compressor stations, with a capacity of 27,000 horsepower, which were installed in conjunction with the pipeline construction. At the present time the Cities Service Gas Company has a total open flow in Texas in excess of 750,000,000 cubic feet daily from 28 wells located on the Empire's gas reserve comprising approximately 150,000 acres.

The third 16-inch line, which is of all-welded construction, has been tested from Ottawa to the Gardner crossover in accordance with the U. S. Bureau of Mines shut-in pressure drop test. It is expected that the final section from the Gardner crossover to Glavin tap will be tested and placed in service in about a week.

MISSOURI COMMISSION GRANTS PERMIT FOR NEW LINE

Early in November the Missouri State Public Service Commission granted a permit to the Missouri-Kansas Pipe Line Company, a Delaware corporation, to construct a gas line from Kansas City to Paola and Osawatomie, Kansas.

The company owns 68,000 acres of land on lease in the shale gas fields of western Missouri and southeastern Kansas, on which there are now 369 producing gas wells.

Franchises have already been granted the company in Belton, Grandview, Martin City, Raymore and Pleasant Hill, and plans to seek franchises in Lee's Summit, Greenwood, Harrisonville, Peculiar, Cleveland, Westline, Drexel and Freeman are under way.

Since April, 1928, the company has been delivering 12,000,000 cubic feet of gas per day to the American Pipeline Company, at a point south of Kansas City.

KIRKVILLE GAS CO. HAS HOME SERVICE DEPT.

The Kirkville, Missouri, Gas Company, a subsidiary of the National Utilities Company, has established a home service department under the direction of Blanche Dusseau of Monroe, Michigan. Miss Dusseau is a graduate of the Battle Creek Sanitarium College and of the Home Arts department of Columbia University. She will give both public and private demonstrations on subjects relating to cooking and home decorating.

ST. JOHNS, KANSAS, GRANTS NATURAL FRANCHISE

St. Johns, Kansas, has granted a gas franchise to Carr W. Taylor of Hutchinson, Kansas, who is acting as a trustee for other interests. According to the franchise which was granted for a period of 20 years, gas will be supplied to the city by October 1st, 1929. The same interests propose to pipe gas to Pratt, Kinsley, Stafford, Larned, Hoisington, Great Bend and other towns in that section.

When next you buy

WHEN next you go to buy a tire, look closely to the reputation of the company that makes it and the dealer that sells it. Consider well their names before you buy.

The degree of service and satisfaction that you may expect to receive from any tire is measurable only by this infallible yardstick.

One reason, perhaps, for the immense popularity of GOODYEAR TIRES and MOTOR TIRES, Inc., for with these two names is linked an enviable reputation, symbolizing long, trouble-free mileage at economical cost.

Tune in on Our Musical Programs Over Radio K F O N Every Monday 8 to 9 P. M.

"A Tire for Every Need"

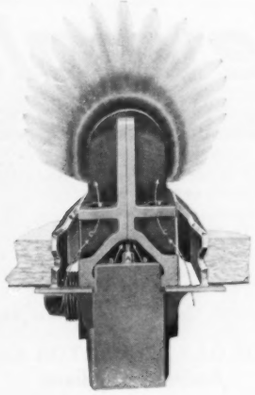
Motor Tires, Inc.

LOS ANGELES
1244 East 8th St.—TRinity 6565
SANTA MONICA
1529 Wilshire Blvd.
283-86

HOLLYWOOD
6523 Santa Monica Blvd.
HOllywood 5524
LONG BEACH
220 E. Anaheim St.—622-79

LOS ANGELES—1228 S. Grand—WEstmore 3554 and 5710
FORMERLY
Truck Tire Service Co.—Zins & Clawson Service Co.

R. M. C.



The gas burner with a snappy, high temperature flame

Rotary Manufacturing Co.

5720 Long Beach Avenue
LOS ANGELES

Empire Oil Meters

Positive Displacement Oscillating Piston Type

Simple in construction, with low cost of maintenance.
Accurate and reliable.
Specially adapted for Cracking and Absorption Processes.
For Gas Companies — Refiners and Distributors of Gasoline and all distillates of petroleum.
For measurement of Crude oils, cold or hot.
Sizes for ½" to 6" pipes.
Standard stock meters for working pressures up to 150 lbs.
Special High Pressure Meters according to specifications up to 600 lbs. working pressure.
Made either with large Vertical Dials or Horizontal Registers.

National Meter Company

San Francisco 1048 Folsom Street — **299 Broadway—New York** — **Los Angeles** 643-645 Santa Fe Ave.

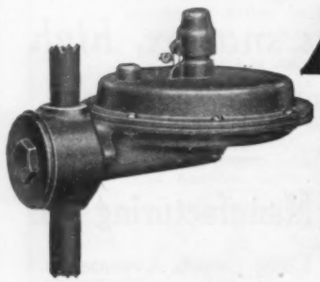
Send for Descriptive Bulletin 110

HEATING--DOMESTIC
and
INDUSTRIAL
GAS APPLIANCES

C. B. Babcock Company

135 Bluxome Street, San Francisco — 2118 Atlantic Street, Los Angeles

MODEL 10 SERIES
With or Without Mercury Seal



Spring Type
Also furnished in Dead Weight Type

Reynolds Gas Control Since 1892

Products for all kinds of Pressure Reduction—for either artificial or natural gas.

GOVERNORS — Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic Quick Closing Anti Vacuum.

REYNOLDS GAS REGULATOR COMPANY
Anderson, Indiana

ST. JOSEPH, MO., EXTENSION WORK STARTED IN OCT.

Work started October 25 on the construction of the Cities Service Gas Company's 12-inch natural gas pipeline from Fort Leavenworth, Kansas, to St. Joseph, Missouri. The St. Joseph extension will connect with the Company's 12-inch line, recently completed, to a point on the U. S. military reservation, cross the Government bridge at Fort Leavenworth and traverse a direct route to St. Joseph. The present section of the line is being used to supply the reservation, gas having been turned into the Fort Leavenworth distribution system October 1.

The entire line will be of welded construction and it is expected that the work will be completed about January 1.

Purchase of the site has been announced for the new town border measuring station which will be located about one-quarter of a mile south of the city limits of St. Joseph on Kinghill avenue. The Gas Service Company recently acquired the distribution property of the St. Joseph Gas Company and the latter company will construct approximately 3,500 feet of 16-inch main line connecting the present distribution system with the new main supply line of the Cities Service Gas Company.

R. H. HUBBELL DIES WHILE IN N. Y. CITY

Announcement is made of the death in New York City, on November 4, of Russell Harry Hubbell, president of Hill, Hubbell & Company, of San Francisco, and vice president of the General Paint Corporation.

During his 25 years manufacture of protective coatings for pipe lines, Mr. Hubbell was the originator of many improvements in that line of work.

Less than 30 days ago the announcement was made of a merger of Mr. Hubbell's company with eight other paint companies on the Pacific Coast, the consolidation to be known as the General Paint Corporation, of which Mr. Hubbell was vice-president in charge of the eastern division.

L. A. WEBSTER PLACED IN CHARGE OF THRALL, KANSAS, PLANT

L. A. Webster, assistant superintendent at the Wichita, Kansas, gasoline plant of the natural gasoline division of Cities Service Gas Company, for the past nine months, has been transferred to the Thrall gasoline plant in Greenwood County, Kansas, as superintendent. He replaces Ira Cunningham who resigned October 24.

Coincident with this change, Gordon Thomasson, who has been conducting special tests at the Tallant plant was transferred to Wichita as assistant superintendent.

W. L. CHISHOLM NAMED PRES. OF PETROLEUM BUREAU

At the annual meeting of the Petroleum Conservation Bureau held October 24th, in Tulsa, Oklahoma, W. L. Chisholm, of Shreveport, Director, Minerals Division, Louisiana Department of Conservation, was re-elected president of the organization. Representatives of the state and national conservation agencies are members of the Bureau. The International Petroleum Exposition at Tulsa was chosen as the place for the next annual meeting.

SACO, MONTANA, NOW HAS NATURAL GAS

Saco, Montana, is enjoying natural gas service. The main lines were completed late in October, and lateral lines are being laid as rapidly as possible.

WESTERN METAL ASSOCIATIONS TO CONVENE AT L. A.

Scheduled to be held in the Shrine Civic Auditorium of Los Angeles, California, January 14 to 18, 1929, the Western States Metal and Machinery Exposition and the Western Metals Congress will meet jointly to discuss various problems encountered during the past year in the work of the two associations. W. H. Eisemann, secretary of the American Society for Steel Treating, has opened offices in the Shrine Auditorium and is making final arrangements for the conclave.

WM. J. HAGENAH BECOMES MEMBER OF BYLLESBY STAFF

Announcement has been made by John J. O'Brien, president of the Byllesby Engineering and Management Corporation, that William J. Hagenah has joined that company as vice-president and special counsel. Mr. Hagenah is known in Oklahoma through many appearances before the corporation commission as a rate and engineering expert for various utility companies. As representative of municipalities, commissions and utility companies, he has been connected with many of the important rate cases in the country during the past 18 years. Mr. Hagenah was formerly chief statistician for the Wisconsin Railroad Commission and consulting expert for the city of Chicago in utility audits and rate studies.

ARKANSAS ASSN. AND N. E. L. A. PLAN JOINT CONVENTION

The annual convention of the Arkansas Utilities Association will be held April 30 to May 3 inclusive, in Hot Springs, Arkansas, the Arkansas utilities men meeting jointly with the Southwestern Division of the N. E. L. A. Convention headquarters will be at the new Arlington Hotel. There is a probability that the convention will include also some divisions of the Southwestern Public Service Association.

SOUTHERN UNION GAS UTILITIES CO. NEWLY FORMED

A utility, organized under the name of the Southern Union Gas Utilities Company by Clint W. Murchison and associates will take over the natural gas lines being operated by that company in Winkler and Ward County, Texas. The newly formed company also plans to extend their system to Pecos in Reeves county. Headquarters for the company are in Dallas.

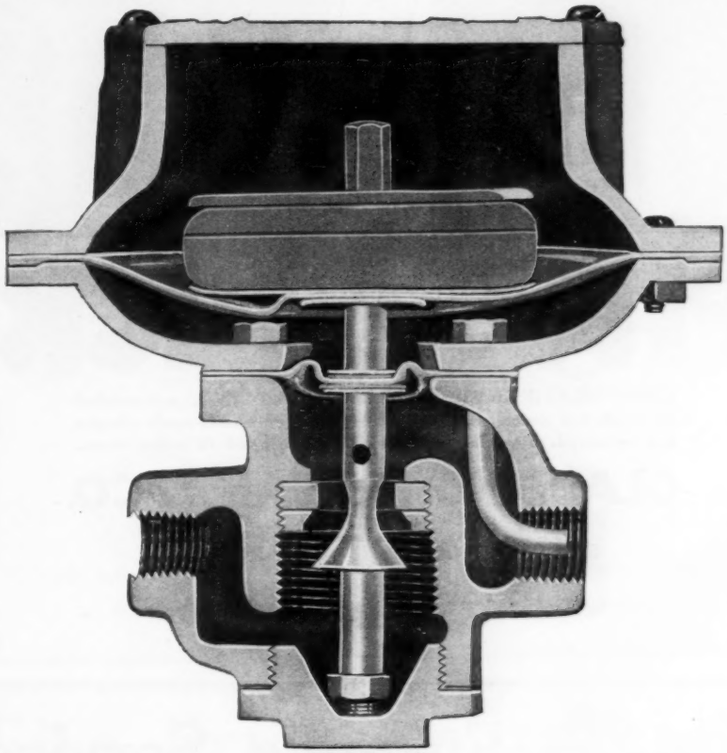
OKLAHOMA NATURAL WILL BUILD THIRD LINE ACROSS ARK. RIVER

The city commission of Tulsa, Oklahoma, has granted permission to the Oklahoma Natural Gas Corporation to lay a third natural gas line across the Arkansas River bridge between Tulsa and West Tulsa. The other two lines extend beneath the bridge. The gas corporation will pay an annual rent of 600 for the new line, which will be a 16-inch line.

LINCOLN BEERBOWER OF ENID, OKLA., DIES SUDDENLY

Lincoln Beerbower of Enid, Oklahoma, manager of the Northern division of the Oklahoma Gas & Electric Company, died suddenly in Oklahoma City on November 20. Mr. Beerbower had come to that city to attend the annual conference of the company, in whose employ he had been for many years.

Reliance Low Pressure or Appliance Regulator



TYPE "A"

This type of regulator is designed for use directly on a gas supply to the appliance or for governing entire house supply up to the limits of inlet pressure and capacity.

Remarkable for its ability to maintain pressures under great demand. Capacity 50% to 100% greater than any other regulator on the market.

Built in sizes 3/8", 1/2", 3/4", and 1".

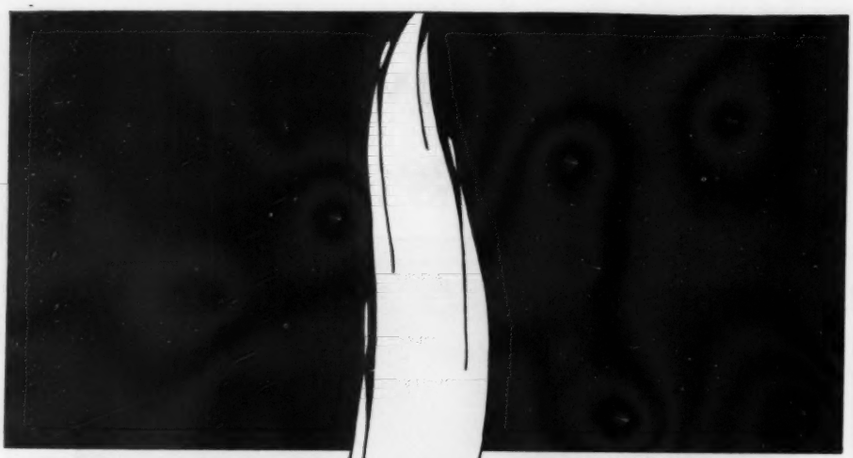
Reliance Manufacturing Company

ALHAMBRA, CALIFORNIA

Mettler Entrained Combustion Gas Burners

FOR ALL Purposes Kinds of gas Pressures

406 S. Main St. LEE B. METTLER, CO. Los Angeles, Cal.



FIRE BRICK

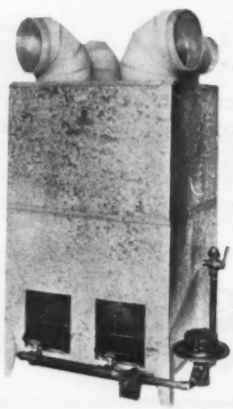
LININGS, CHECKERS and BOILER SETTINGS are carried in stock for quick shipment. If special or hand-made shapes are required, our plant is especially equipped to make them.

GLADDING, McBEAN & CO.

SAN FRANCISCO LOS ANGELES

PORTLAND SEATTLE

419



Furnace Service

How much of your overhead is represented by unnecessary trips to your job?

In other words does your furnace or your service man render your service?

Install **Perfection Multiple Unit Furnaces** and cut down on your overhead.

L. H. Freymuth Jr

311 East Pico St., Los Angeles

The War Department, after a two year test, has purchased 140 No. 1 and No. 2 Electrogas Floor Furnaces for the San Francisco Presidio.

quality ELECTROGAS FURNACE CO. SAN FRANCISCO economy

MAGNOLIA GAS CO. COMPLETES SAREPTA-ALTA LINE

The Magnolia Gas Company line, completed in October from Sarepta in Webster Parish, Louisiana, to Alto in Richland Parish, by way of Sterlington in Ouachita Parish, a total distance of 106 miles, practically doubles the gas supply for that company.

Electric welded pipe, made of 60,000 pounds tensile strength steel, equipped with bell and spigot and flexible expansion joints, was used on the line which is 16, 18 and 20 inches in diameter.

The line was designed to operate at 750 pounds pressure and was tested for 900 pounds pressure. The capacity of the line is 150,000,000 cubic feet per day to Sterlington and 125,000,000 cubic feet per day to Sarepta. Forty miles of the 20-inch pipe and 15 miles of the 16-inch pipe were welded with the electrical process, while the remainder was welded by the acetylene crews of the Magnolia.

The line connects at Sarepta with two 16-inch lines to Latex, which is the junction point for the line extending west to Dallas and Fort Worth, and the line extending south to Beaumont and Port Arthur. The distance from Alta to Fort Worth is approximately 370 miles and the distance from Alta to Port Arthur is practically the same.

R. E. BRIGHAM OF CITIES SERVICE CO., PROMOTED

R. E. Brigham, for the past three years chief clerk of the gas production department of the Cities Service Gas Company, was promoted November 1 to the Wichita district, where he will be engaged in scouting and other departmental activities.

Mr. Brigham is succeeded as chief clerk by E. C. Cortelyou, who has been doing engineering work in the gas production department for the past year.

Coincident with these promotions, C. C. Haberson, who has held the position of scout in the Southwest Kansas district, was assigned to special duties in connection with the gas production department.

F. H. BIVENS OF SO. COUNTIES RECOVERS FROM ILLNESS

After an illness of more than six weeks, much of which was spent on a hospital bed, F. H. Bivens, vice-president of the Southern Counties Gas Company in charge of public relations and sales, is back at his desk. Personal friends throughout Southern California, among them many employees of Southern Counties, kept his room converted into a veritable garden of flowers during his illness, and rejoice that his recovery was attained without the necessity of a major operation.

CHARLES L. BULLOCK IS NEW PRES. OF WICHISON GAS CO.

Charles L. Bullock has been elected president of the Wichison Gas Company and the Rice County Gas, Electric & Power Company, both of Wichita, Kansas. He was also recently elected vice-president of the Larutan corporation. For the last three years he has served the first two companies as vice-president in charge of management.

J. A. BELL IS SALES MANAGER OF KANSAS PIPE LINE AND GAS CO.

J. A. Bell, assistant new business manager of the Capital Gas and Electric Company of Topeka, Kansas, has been appointed general sales supervisor of the Kansas Pipe Line and Gas Company, a subsidiary of the North American Power and Light Company.

MERGER OF MONTANA COMPANIES ANNOUNCED

Sale of the assets of the Northern Gas Development Company of Montana, now known as the Climax Natural Gas Company, to the Northeastern Natural Gas Development Company of Delaware is announced by officials of both companies.

The Northeastern Natural Gas Development Company, of Delaware, has filed articles of incorporation for $250,000 under the laws of the state of Montana. Great Falls is named headquarters for the company, and Jos. C. Jordan is company representative.

LA JUNTA, SWINK AND ROCKY FORD, COLO., WILL HAVE GAS

Under new franchises, now being asked by the Forshay Gas Company through its representatives, A. E. Shippee and W. Flanders, the towns of La Junta, Swink and Rocky Ford, Colorado, would receive natural gas from Pueblo's main line at a low rate. It is proposed to tap the line running from the Amarillo field to Denver through the southwest corner of Otero county.

January 15, 1929, is the date set for the special election to decide on the franchise at La Junta.

WESTERN GAS CO. BUYS CALDWELL, KAN., CO.

The Western Gas Company, a subsidiary of the Public Utilities Investment Company of Salina, Kansas, has purchased the Caldwell, Kansas, Gas Company. The purchasing concern serves gas at Anthony, Eureka, Toronto, Neal and other northern Kansas tows. C. B. Shaklee of Anthony, is general superintendent of the Western Gas Company. The company is now laying a 4-inch line for the gas field southwest of Toronto, to Eureka, a distance of 11 miles.

DES MOINES GAS CO. ORDERS FOUR CONDENSERS

Des Moines Gas Company of Des Moines, Iowa, has placed order with The U. G. I. Contracting Company, a division of United Engineers & Constructors, Inc., for the installation of two U. G. I. 4-pass high duty condensers. These condensers will have a capacity to cool 6,000,000 cubic feet of gas daily. The condenser water will be used in a circulating system for heating holders during the cold weather.

PLANS UNDER WAY FOR GAS PLANT IN REGINA, SASK.

Erection of a gas plant at Regina, Saskatchewan, is in project, according to representatives of the Drake-Jones Company of Minneapolis, Minnesota. The plant will cost approximately $1,250,000 and will serve 5,000 consumers. The plans have been laid before the city council of Regina.

CHICAGO NAMED SITE OF NEXT SALES COUNCIL MEET

The next regular meeting of the Mid-West Industrial Gas Sales Council will be held January 25, 1929, at the Palmer House, Chicago, Illinois. In addition to the regular program, officers for the coming year will be elected.

WALTER M. BERRY, L. A. GAS ENGINEER, MOVES OFFICE

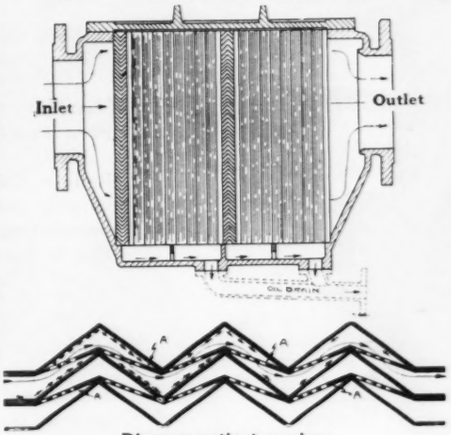
Walter M. Berry, consulting gas engineer of Los Angeles, announces the removal of his office to 726 Petroleum Securities Building, Tenth and Flower Streets, of that city.

Install

PIONEER SEPARATORS

For Removal of All DIRT AND MOISTURE From GAS TRANSMISSION Lines

The 10 in. size has 56 separated vertical streams which pass over enormous and effective baffle surfaces, ensuring 100% purification of each and every stream—independent of the adjacent streams.



The 10 in. size has 1680 separate catch pockets with vertical drains, and the Gas Stream changes its direction of travel, velocity and shape 8400 times.

Diagrammatic top view of Pioneer Separator showing principle. The thin, long arrows indicate the flow of the steam, air, gas, etc. The heavy short arrows show the flow of extracted impurities. Letter A indicates catch pockets.

PIONEER EQUIPMENT CORPORATION OF AMERICA

231 BROADWAY NEW YORK

General Representative for California

H. PLUMMER, 806 FIFE BUILDING SAN FRANCISCO

Fire Brick Contractors

Established 1906

J. T. Thorpe & Son

Inc.

Specializing in Gas Generator, Boiler, Still and Furnace Brick, Industrial Furnaces, Retorts, Kilns, Brick Smokestacks.

A capable Engineering Department competent to advise on any problem involving firebrick construction.

San Francisco	Seattle	Portland	Los Angeles
417 Market St.	305 White Bldg.	609 Ry. Exch. Bldg.	321 W. 3rd St.

HOT-N-KOLD

The Hot-N-Kold Shops are now serving the public in eight cities in the northern part of California with Kelvinator Refrigeration, Holbrook Ranges, Welsbach Water Heaters, and other major appliances.

A valuable business franchise awaits the right dealer in every town.

HOT-N-KOLD CORPORATION

949 Mission Street San Francisco, California

GILFILLAN
Dual Control Valve Regulators

Write for literature

SAVE ONE INSTALLATION

Maintain a constant steam pressure on the boiler
and
Reduce and maintain an unvarying gas pressure to the burner regardless of the variation in line pressure.

Built to control Boiler pressure from one pound to 200 pounds steam, and deliver as low as two ounces gas pressure at the burner.

GILFILLAN MACHINE WORKS, Inc.
Ebenezer, Erie Co., N. Y.

Representatives
Jensen Instrument Co., 624 E. Fourth St., Los Angeles, Calif.
Gas Appliance Service Corp, 2014 Bryan St., Dallas, Texas.
The Diamond Supply Co., Charleston, W. Va.

The Magic Way Company

Gas Heating Devices

including

"Magic Way" Gas Furnaces
"Magic Way" Control Valves and Switches
"Potter" Radiators
"Steel Made" Radiators
"Cole" Floor and Wall Heaters
"Hall" Floor Furnaces

Manufactured by

Magic Way Company
National City San Diego California

ARIZONA LIGHT AND POWER CO. INSTALLS PURIFIER

A two compartment Steere welded steel purifier is being built for the Central Arizona Light and Power Company, with headquarters at Phoenix, by the Semet-Solvay Engineering Corporation of New York. The purifier box will be 44 feet long, 30 feet wide and 13 feet high. It will be equipped with two layers of trays, each supporting five-foot layers of oxide. The unit will allow for the adding of additional boxes on either end. All seams will be welded inside and out and the purifier and 24-inch welded steel manifold and valves will be submitted to tests for tightness. Oxide will be handled with the assistance of an elevator and a gantry crane will raise and lower the covers of the box.

COMMERCIAL LAW COURSE IS POPULAR WITH L. A. G. AND E.

An additional course in the educational program of the Los Angeles Gas and Electric Employees Association opened on November 7, under the direction of Dr. W. Maxwell Burke of the California Extension Division. The new class in Commercial Law is proving popular with members of the association.

P. G. AND E. ASKS PERMIT TO EXERCISE FRANCHISE

Pacific Gas and Electric Company has applied to the California Railroad Commission for a permit to exercise franchise rights granted to the company by the town of Belvedere, California, for the distribution of gas.

GEORGE WILMARTH NAMED CHIEF ENGINEER OF POWER CO.

George Wilmarth has recently resigned as manager of the Wisconsin division of the Northern States Power Company to become chief engineer of that company with headquarters in Minneapolis.

GLEN CONKLIN IS AUDITOR OF COAST COUNTIES G. & E.

Glen Conklin has been recently appointed auditor of the Coast Counties Gas & Electric Company, succeeding N. W. Johnson, who has left Coast Counties to become vice-president of the Santa Cruz Seaside Company.

J. W. REED VISITS COOPER CO. FACTORY AT MT. VERNON, O.

J. W. Reed, California manager for the C. & G. Cooper Company, left the Coast the 24th of November for a visit to the company factory at Mt. Vernon, Ohio. Mr. Reed is accompanied by Mrs. Reed and expects to return to the Coast about December 5th.

F. W. HARVEY NEW BRANCH MGR. FOR KANSAS G. & E. CO.

F. W. Harvey of the Kansas Gas & Electric Company, has been named as manager of the Potwin, Kansas, branch of the company, to succeed M. A. Pope, who has resigned.

B. C. ELECTRIC AND GAS ENLARGES PLANT

An extension to the plant of the British Columbia Electric Power and Gas Company, Vancouver, B. C., is being constructed at a cost of $17,000. It will be a structural steel building with brick exterior.

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge.

HELP WANTED—MALE

Men interested in South American Work with large oil, mining companies who pay fare and expenses, write for our warranted service offer. South American Service Bureau, 14600 Alma, Detroit, Michigan.

CITIES SERVICE NET EARNINGS INCREASE IN 1928

Net earnings of Cities Service Company for the 12 months ended October 31, 1928, were the largest in the company's history, amounting to $32,714,666, an increase of $1,470,416 over net earnings for the 12 months ended October 31, 1927. Net earnings for October also set a new record for October earnings amounting to $2,891,169.

HARDIN, MONT., TO HAVE GAS EARLY IN DECEMBER

A supply of more than 350,000 cubic feet of gas is available for the city of Hardin, Montana, according to officials of the Big Horn Oil & Gas Development Company, holders of a natural gas distribution franchise in that city. It is stated that gas will be delivered there early in December.

GEORGE W. SMITH RE-ELECTED TREASURER OF CIVIC BODY

George W. Smith, Santa Barbara district manager of the Southern Counties Gas Company, was re-elected treasurer of the Santa Barbara Chamber of Commerce at a recent meeting of the board of directors of that body.

E. B. HAGAR OF ARCO COMPANY VISITS HEADQUARTERS OFFICE

E. B. Hagar, Pacific Coast Manager of the Arco Company with headquarters in San Francisco, has left for the east, where he will spend from a month to six weeks at the main office of the company in Cleveland and in New York.

L. S. PITCHER IS NORTHWEST MANAGER FOR METER CO.

L. S. Pitcher, who formerly represented the Pittsburg Equitable Meter Company in Texas, has taken over the northwest territory for his company, including Washington, Oregon, Idaho, and Montana.

S. W. CASE NAMED PACIFIC DIST. MGR. FOR BRISTOL CO.

S. W. Case, district manager of the Bristol Company of Waterbury, Conn., has been transferred from the St. Louis, Missouri, branch office to the San Francisco branch office as Pacific district manager.

CONRAD, MONT., CITY COUNCIL EXTENDS FRANCHISE

The Conrad, Montana, city council has granted an extension of the franchise for distribution of natural gas to that city to Emerick and Darling, president holders of the franchise.

When you do your trench construction work with The Cleveland Baby Digger you do the job the efficient way, eliminating hand labor.

This little trencher by its performance has demonstrated that a trencher can be fast, rugged and powerful and yet so compact and light that it will operate with high efficiency in the very limited spaces as well as in the larger areas delivering a maximum trench footage in the toughest and hardest soils.

Within its digging range 5′ 6″ and 10½″ to 23½″ wide you'll find the Baby Digger a most usable, practical, economical trencher. The most efficient way to dig gas trench next year and every year.

Write, phone or wire for full information and be set for real savings in your pipe laying work in 1929.

The Cleveland Trencher Co.
20100 St. Clair Ave., Cleveland
17th and Folsom Streets
San Francisco, Calif.

ORIFICE FITTINGS

They eliminate old style by-pass
They save materials
They save time
They save labor
Changing plates is simplified
Orifice is always centered
Frequent inspection is possible
Occupy little space
Make for better metering
No hazards
Cannot leak, etc.

ROBINSON ORIFICE FITTING COMPANY
1435 SANTA FE AVENUE
LOS ANGELES, CALIF., U.S.A.

If you can't afford to extend your lines use ROCKGAS

Hold your potential customers by giving them temporary service with ROCKGAS in territories where you are not yet ready to extend your lines. Or permanent service where extension of lines is impractical.

ROCKGAS
a pure natural gas

—liquified under pressure in convenient sized tanks. Smallest, 12x37 inches; holds equivalent of 2666 cu. ft. 500 B. t. u. gas. Largest, holds equivalent of 36,550 cu. ft. 500 B. t. u. gas. Other sizes to meet any requirements.

ROCKGAS now used and endorsed by homes, camps, stores, etc., throughout the United States.

A few rich California territories open for distributors. Write today for full details.

IMPERIAL GAS CO.
3190 Walnut St.
(Sta. B, Box 3028)
Long Beach, Calif.

A WESTERN GUIDE to INDUSTRIAL PURCHASING

Readers interested in any articles not listed in these pages are cordially invited to advise *Western Gas* of their wants and every effort will be made to furnish a list of the proper manufacturers. Addresses of companies listed on these pages may be found by consulting their advertisements in this issue.

Absorption and Compression Plant Equipment
Baker Iron Works.
Chaplin-Fulton Mfg. Co.
Jensen Instrument Co.
The E. A. Key Company
Western Pipe & Steel Co.

Absorption Towers
Baker Iron Works.
Western Pipe & Steel Co.

Adjustable Plugs
Lattimer-Stevens Co.
Western Pipe & Steel Co.

Agitators
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Aluminum Bronze Powder for Paint
W. P. Fuller & Co.
Hill, Hubbell & Co.

Analyzers
Fort Worth Laboratories.
Smith-Emery Co.

Apparatus, Experimental Gas
The Bartlett Hayward Co.
Pacific Meter Works.

Appraisals and Valuations
Charles R. Collins.
Smith-Emery Co.
United Engineers & Constructors, Inc.

Automobile Tires
Motor Tires, Inc.

Bags, Gas Main
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Barometers
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
Westcott & Greis, Inc.

Bench Iron Work
The Bartlett Hayward Co.
General Gas Light Co.

Blocks and Tiles, Fire Clay
Gladding, McBean & Co.
Stockton Fire Brick Co.

Blowers and Boosters
Ingersoll-Rand Co.
Connersville Blower Co.
The P. H. & F. M. Roots Co.
United Engineers & Constructors, Inc.

Boiler Controls
The Cleveland Heater Co.
Gilfillan Machine Works, Inc.

Boiler—Brickwork
J. T. Thorpe & Son, Inc.

Boiler Equipment
E. A. Key Co.

Boiler Maker's Tools
E. A. Key Co.

Boilers, Gas-Fired
American Radiator Co.
C. B. Babcock Co.
Baker Iron Works.
Leahy Mfg. Co.

Boiler Settings, Pipe and Boiler Insulation
Pioneer Paper Company.
J. T. Thorpe & Son, Inc.

Boilers, Waste Heat
Baker Iron Works.
The Bartlett Hayward Co.
Phillips Heating, Ventilating & Mfg. Co.
United Engineers & Constructors, Inc.

Boilers, Water Tube
Baker Iron Works.
Western Pipe & Steel Co.

Breakers
Ingersoll-Rand Co.

Breeching (Boiler and Stack)
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Brick, Firebrick
Gladding, McBean & Co.
Stockton Fire Brick Co.
United Engineers & Constructors, Inc.

Brick, Firebrick—Installation
J. T. Thorpe & Son, Inc.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Buildings, Steel
Baker Iron Works.
United Engineers & Constructors, Inc.
Western Pipe & Steel Co.

Bunkers, Steel and Concrete
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Burners, High Pressure
Leahy Mfg. Co.
Lee B. Mettler.
Rotary Manufacturing Co.

Burners, Low Pressure
C. B. Babcock Co.
The Bartlett Hayward Co.
Duro Gas Burner Company.
General Gas Light Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Lee B. Mettler.
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
Rotary Manufacturing Co.
Western Pipe & Steel Co.

Burners—Oil
Leahy Mfg. Co.
Rotary Manufacturing Co.

By-Product Recovery Apparatus
The Bartlett Hayward Co.

Calorimeter Accessories
Fort Worth Laboratories.
Pacific Meter Works.
United Engineers & Constructors, Inc.

Cases, Meter
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Casinghead, Gas Meters
The Bristol Company
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.

Casing and Tubing (steel)
South Chester Tube Co.

Casing—Iron
South Chester Tube Company

Cast Iron Pipe
McWane Cast Iron Pipe Co.
United States Cast Iron Pipe and Foundry Co.

Castings
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Cement
Stockton Fire Brick Co.

Cement, High Temperature
Stockton Fire Brick Co.

Centrifugal Pipe
United States Cast Iron Pipe and Foundry Co.

Charging Machines (retort, etc.)
The Bartlett Hayward Co.

Checker Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Chemical and Gas Testing Apparatus
Fort Worth Laboratories.
Pacific Meter Works.
Stauffer Chemical Co.
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Chemists, Analytical
Fort Worth Laboratories.
Smith-Emery Co.

Chimneys, Radial Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Chimneys, Radial Brick Installation
J. T. Thorpe & Son, Inc.

Chutes (coal, coke, ash)
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Clamps and Sleeves, Pipe
S. R. Dresser Mfg. Co.
Mueller Co.

Clamps, Service
Mueller Co.

Cleaners, Service
C. B. Babcock Co.
Pacific Meter Works.

Coal Gas Plants
Charles R. Collins.
The Bartlett Hayward Co.

Coal Tar Products and Chemicals
W. P. Fuller & Co.

Cocks
C. B. Babcock Co.
Johnson Gas Appliance Co.
Lattimer-Stevens Co.
Leahy Mfg. Co.
Merco Nordstrom Valve Co.
Mueller Co.
Geo. D. Roper Corporation.

Collectors, Dust
Western Pipe & Steel Co.

Compressors, Air
Ingersoll-Rand Co.
Leahy Mfg. Co.

Compressors, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, High Pressure
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, Portable
Ingersoll-Rand Co.

Condensers
Baker Iron Works.
The Bartlett Hayward Co.
Ingersoll-Rand Co.

Condenser Boxes
Baker Iron Works.

Controllers
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
The Foxboro Co., Inc.
Robertshaw Thermostat Co.

Controls, Air and Steam
The Bartlett Hayward Co.
The Bristol Company
The Foxboro Co., Inc.
Jensen Instrument Co.

Cooling Systems
The Bartlett Hayward Co.

Cooling Towers
J. B. Gill Corporation.

Counters, Revolution
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.

Couplings
S. R. Dresser Mfg. Co.
The Bartlett Hayward Co.

Couplings—Flexible Rope & Spider Arm
The P. H. & F. M. Roots Co.

Coverings (Tank, Boiler, Cold and Steam Pipe)
Pioneer Paper Company.

Cubic Foot Bottle
Pacific Meter Works.

Cutters, Pavement
Ingersoll-Rand Co.

Cylinders, Compressors
The C. & G. Cooper Co.

Dephlegmaters
Western Pipe & Steel Co.

Diaphragms, Meter
Chaplin-Fulton Mfg. Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Diggers, Clay
Ingersoll-Rand Co.

Discharging Machines (retort, etc.)
The Bartlett Hayward Co.

Door, Clean-out
Baker Iron Works.

Drills
Ingersoll-Rand Co.
Mueller Co.

Drill Pipe—Iron
South Chester Tube Company

Drill Pipe—Steel
South Chester Tube Company

Elevators
Baker Iron Works.

Engineers and Engineering Service
Charles R. Collins.
J. B. Gill Corporation.
The Bartlett Hayward Co.
Smith-Emery Co.
United Engineers & Constructors, Inc.
Western Pipe & Steel Co.

Engines, Diesel
The C. & G. Cooper Co.

Engines, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.
United Engineers & Constructors, Inc.

Engines, Oil
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Engines, Steam
Ingersoll-Rand Co.

Evaporating Apparatus
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Excavators, Ditch and Trench
The Cleveland Trencher Co.

Exchangers, Heat
Baker Iron Works.
Western Pipe & Steel Co.

Exhausters
Connersville Blower Co.
Ingersoll-Rand Co.
United Engineers & Constructors, Inc.
United States Cast Iron Pipe and Foundry Co.
The P. H. & F. M. Roots Co.

Experimental Apparatus
The Bartlett Hayward Co.
Pacific Meter Works.

Filters
United States Cast Iron Pipe and Foundry Co.

Fire Clay and Products
Gladding, McBean & Co.
Stockton Fire Brick Co.

Fire Brick Contractors
J. T. Thorpe & Son, Inc.
Stockton Fire Brick Co.

Fittings
The Bartlett Hayward Co.
McWane Cast Iron Pipe Co.
United States Cast Iron Pipe and Foundry Co.

Fixtures, Lighting (Domes, Portables, etc.)
C. B. Babcock Co.
Welsbach Company.

Fire Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Flanges
Pittsburgh Equitable Meter Co
Westcott & Greis, Inc.

Forgings
Baker Iron Works.
Payne Furnace & Supply Co.
Geo. D. Roper Corporation.
J. T. Thorpe & Son, Inc.

Furnaces, Floor
Electrogas Furnace Co.
Magic Way Company
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.

Furnaces, Heating
The Estate Stove Co.
Payne Furnace & Supply Co.
Magic Way Company.
Pacific Gas Radiator Co.
Phillips Heating, Ventilating & Mfg. Co.

Furnaces, Industrial
C. B. Babcock Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Mueller Co.
Payne Furnace & Supply Co.

Gas Analysis Apparatus
The Foxboro Co., Inc.
Fort Worth Laboratories.
Jensen Instrument Co.
Pacific Meter Works.
United Engineers & Constructors, Inc.

Gas Masks
Safety Gas Main Stopper Co.

Gas Main Tapping & Drilling Machines
Mueller Co.

Gaskets
The E. A. Key Company
Pittsburgh Equitable Meter Co
Safety Gas Main Stopper Co.
Southwestern Pipe Joint and Engineering Co.

Gasket Compound
W. P. Fuller & Co.
E. A. Key Co.

Gas Pipe Line Construction
Western Pipe & Steel Co.

Gates—Wind & Blast
The P. H. & F. M. Roots Co.

Gauges
The Bristol Company
Fort Worth Laboratories.
The Foxboro Co., Inc.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Westcott & Gries, Inc.

Gauges, Steam
The Bristol Company
Jensen Instrument Co.
The Foxboro Co., Inc.
Westcott & Gries, Inc.

Gauges, U Type
C. B. Babcock Co.
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
Lee B. Mettler.
Pacific Meter Works.
Safety Gas Main Stopper Co.
The Foxboro Co., Inc.
Westcott & Gries, Inc.

Generators, Water Gas
The Bartlett Hayward Co.
Baker Iron Works.

Glassware
Fort Worth Laboratories.
Westcott & Gries, Inc.

Governors
C. B. Babcock Co.
Chaplin-Fulton Mfg. Co.
Pacific Meter Works.
Reynolds Gas Regulator Co.
Sprague Meter Co.
Westcott & Greis, Inc.

Hammers
Ingersoll-Rand Co.

Hanger, Meter
Mueller Co.

Hangers, Iron and Steel
Baker Iron Works.

Heaters
American Radiator Co.
C. B. Babcock Co.
Baker Iron Works.
The Estate Stove Co.
General Gas Light Co.
Magic Way Company.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
Welsbach Company.

Heaters, Floor
General Gas Light Co.
Magic Way Company.
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.

Heaters, Wall
C. B. Babcock Co.
General Gas Light Co.
Magic Way Company.
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.

Heat Exchangers
Baker Iron Works
Western Pipe & Steel Co.

Heat Interchangers
Western Pipe & Steel Co.

SPRAGUE SEMI-CHROME LEATHER

Resists acids
and boiling water.

Now Used in All

SPRAGUE METERS AND REGULATORS

After

FIVE YEARS' TESTS AND EXPERIMENTS

May we send you
samples and data?

The Sprague Meter Co.

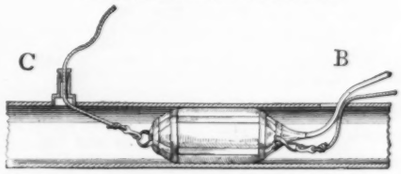
BRIDGEPORT, CONN.
Los Angeles, Calif., San Francisco, Calif.
Newark, Ohio
Davenport, Iowa Houston, Texas

Pipe Stoppers

2" TO 48"

Goodman Cylindrical Stopper

For Any Pipe—
Intermediate Pressures



Gas Main Bags

FOUR TYPES

Type A—Seamless, reinforced tube.
Type B—Reinforced seams, for heavy duty.
Type C—Canvas-covered for use where plain rubber will not last.
Type D—Red rubber, pure gum, for dry mains.

Safety Gas Main Stopper Company

523 Atlantic Avenue
Brooklyn, N. Y.
Cable Address: Gastopper, N. Y.

Hoists
Ingersoll-Rand Co.

Holders
The Bartlett Hayward Co.
Baker Iron Works.
United Engineers & Constructors, Inc.

Holders, High Pressure
Baker Iron Works.
Western Pipe & Steel Co.

Hoppers
The Bartlett Hayward Co.

Hose, Air
Ingersoll-Rand Co.

Hot Plates
C. B. Babcock Co.
Johnson Gas Appliance Co.
Geo. D. Roper Corporation.

Hygrometers
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Incinerators
C. B. Babcock Co.
Baker Iron Works.
J. T. Thorpe & Son, Inc.
Western Pipe & Steel Co.

Incinerator Brickwork
J. T. Thorpe & Son, Inc.

Indicators
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Instruments (Measuring, Testing and Recording)
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
Pacific Meter Works.
The Foxboro Co., Inc.
United Engineers & Constructors, Inc.
Westcott & Gries, Inc.

Insulating Materials
W. P. Fuller & Co.
Pioneer Paper Company.
Stockton Fire Brick Co.

Joint Runners Asbestos
Safety Gas Main Stopper Co.
United Engineers & Constructors, Inc.

Kilns
J. T. Thorpe & Son, Inc.
Western Pipe & Steel Co.

Kilns—Brickwork
The Bartlett Hayward Co.

Laboratory Supplies
Fort Worth Laboratories.
Mueller Co.
Westcott & Greis, Inc.

Ladles, Hot Metal
Mueller Co.

Lamps
C. B. Babcock Co.
General Gas Light Co.
Welsbach Company.

Lighters
C. B. Babcock Co.
Tappan Stove Co.

Lighting Incidentals
C. B. Babcock Co.
Welsbach Company.

Line Pipe—Iron
South Chester Tube Company

Line Pipe—Steel
A. O. Smith Corporation
South Chester Tube Company

Linings—Brickwork
J. T. Thorpe & Son, Inc.

Linings—Car
Pioneer Paper Company.

Main, Bags
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Mains, Street
United Engineers & Constructors, Inc.
United States Cast Iron Pipe and Foundry Co.

Main, Stopper
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Mantles, Gas Lighting
C. B. Babcock Co.
General Gas Light Co.
Welsbach Company.

Manometers
Fort Worth Laboratories.
Jensen Instrument Co.
Lee B. Mettler.
Westcott & Greis, Inc.

Meters, Air
The Bristol Company
Connersville Blower Co.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.
The P. H. & F. M. Roots Co.
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Meters, Boiler
The Bristol Company
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., inc.

Meters, Burner Test
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Cast Iron Gas
The Bartlett Hayward Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meter Connections
Lattimer-Stevens Co.
Pacific Meter Works
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Complaint
Pittsburgh Equitable Meter Co

Meters, Consumers
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Flow
The Foxboro Co., Inc.
Jensen Instrument Co.
Pittsburgh Equitable Meter Co
Westcott & Greis, inc.

Meters, Fluid
The Bristol Company
The Foxboro Co., Inc.
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Company
Westcott & Gries, Inc.

Meters, Gas
Connersville Blower Co
Jensen Instrument Co.
National Meter Company
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.
The P. H. & F. M. Roots Co.

Meters, Gasoline and Oil
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Co
Westcott & Gries, Inc.

Meters, High Pressure Distribution
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Co
Pacific Meter Works.
Sprague Meter Co.
The Foxboro Co., Inc.

Meters, High Pressure Iron Case
The E. A. Key Company
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Industrial Consumers
The Bristol Company
Connersville Blower Co.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.
The Foxboro Co., Inc.
The P. H. & F. M. Roots Co.

Meters, Iron Case
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Laboratory
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.
Westcott & Greis, Inc.

Meters, Large Capacity
Connersville Blower Co.
Jensen Instrument Co.
Pacific Meter Works.
Sprague Meter Co.
The P. H. & F. M. Roots Co.
Westcott & Greis, Inc.

Meters, Oil
Connersville Blower Co.
The Foxboro Co., Inc.
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Co
The P. H. & F. M. Roots Co.
Westcott & Greis, Inc.

Meters, Orifice
Jensen Instrument Co.
Pacific Meter Works.
Robinson Orifice Fitting Co.
The Foxboro Co., Inc.
Robinson Orifice Fitting Co.
Westcott & Greis, Inc.

Meters, Oxygen
Fort Worth Laboratories.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Oxygen and Hydrogen
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Prepayment
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meter Seals
Lattimer-Stevens Co.

Meter Shelves
Lattimer-Stevens Co.

Meter Swivels and Caps
Lattimer-Stevens Co.

Meters, Station
Connersville Blower Co.
The Bartlett Hayward Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The P. H. & F. M. Roots Co.

Meters, Steam
The Bristol Company
Jensen Instrument Co.
The Foxboro Co., Inc.
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Meters, Test
Fort Worth Laboratories
Pacific Meter Works.
Lattimer-Stevens Co.
Sprague Meter Co.
Westcott & Greis, Inc.

Meters, Water
Jensen Instrument Co.
Lattimer-Stevens Co.
National Meter Company
Westcott & Greis, Inc.

Meters, Wet Test
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Mixers, Gas and Air
C. B. Babcock Co.
Geo. D. Roper Corporation.
Pacific Gas Radiator Co.

Oil, Diaphragm
Pacific Meter Works.

Over Heat Control
Robertshaw Thermostat Co.

Oxide
C. B. Babcock Co.
Stauffer Chemical Co.

Packing, Asbestos
Safety Gas Main Stopper Co.

Paint
The Arco Company.
Everlasting Paint & Sales Co.
W. P. Fuller & Co.
Pioneer Paper Company.
Hill, Hubbell & Company.
United Engineers & Constructors, Inc.

Photometers
Pacific Meter Works.
United Engineers & Constructors, Inc.

Pilots
The Cleveland Heater Co.
Payne Furnace & Supply Co.
Spencer Thermostat Co.

Pipe
A. O. Smith Corporation
McWane Cast Iron Pipe Co.
United States Cast Iron Pipe and Foundry Co.
Western Pipe & Steel Co.

Pipe Compound
E. A. Key Co.

Pipe, Copper
Mueller Co.

Pipe Covering
Hill, Hubbell & Company.
Pioneer Paper Company.

Pipe Couplings
S. R. Dresser Mfg. Co.

Pipe—Iron
South Chester Tube Company

Pipe—Steel
A. O. Smith Corporation
South Chester Tube Company

Pipe Coils, Bends, Van Stone Joints, Gasketless Flange Joints, Welded Nozzle Headers
Southwestern Pipe Joint and Engineering Co.

Pipe Jointers
Mueller Co.

Plugs (testing mains and running service)
C. B. Babcock Co.
Jensen Instrument Co.
The Foxboro Co., Inc.
Safety Gas Main Stopper Co.
United States Cast Iron Pipe and Foundry Co.

Pre-Heaters
Baker Iron Works.
Western Pipe & Steel Co.

Producers, Gas
United Engineers & Constructors, Inc.
United States Cast Iron Pipe and Foundry Co.

Provers, Meter
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Pumps
C. B. Babcock Co.
Connersville Blower Co.
Ingersoll-Rand Co.
Mueller Co.
Pacific Meter Works.
Geo. D. Roper Corporation.
Safety Gas Main Stopper Co.
The P. H. & F. M. Roots Co.

Pumps—Liquid
The P. H. & F. M. Roots Co.

Pumps—Vacuum
The P. H. & F. M. Roots Co.

Purifiers
Baker Iron Works.
The Bartlett Hayward Co.
United Engineers & Constructors, Inc.

Purifying Materials
C. B. Babcock Co.
Stauffer Chemical Co.
United Engineers & Constructors, Inc.

Purifiers, Oil Absorption
Western Pipe & Steel Co.

Pyrometers (Indicating and Recording)
The Bristol Company
Fort Worth Laboratories
Jensen Instrument Co.
Westcott & Greis, Inc.

Radiants
C. B. Babcock Co.
General Gas Light Co.

Radiant Heaters
C. B. Babcock Co.
General Gas Light Co.
Pacific Gas Radiator Co.
Welsbach Company.

Radiators—Gas Fired
American Radiator Co.
Magic Way Company.
Pacific Gas Radiator Co.

Ranges
C. B. Babcock Co.
The Estate Stove Co.
Geo. D. Roper Corporation.
Tappan Stove Co.

Ranges, Closed Top
C. B. Babcock Co.
Geo. D. Roper Corp.
Tappan Stove Co.

Receivers, Air
Ingersoll-Rand Co.
Western Pipe & Steel Co.

Recorders
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Refrigerating Machinery
C. & G. Cooper Co.
Ingersoll-Rand Co.

Refractory Materials
Gladding, McBean & Co.
Stockton Fire Brick Co.
United Engineers & Constructors, Inc.

Regulators, Heat
American Radiator Co.
C. B. Babcock Co.
Leahy Mfg. Co.
Magic Way Company.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
The Foxboro Co., Inc.

Regulators, High Pressure
C. B. Babcock Co.
Leahy Mfg. Co.
The Bristol Company
Chaplin-Fulton Mfg. Co.
Fort Worth Laboratories.
Gilfillan Machine Works, Inc.
Reliance Mfg. Co.
Mueller Co.
Reynolds Gas Regulator Co.
Sprague Meter Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Regulators, Hot Water Heat Control
The Bristol Company
Mueller Co.

Regulators, Low Pressure
C. B. Babcock Co.
The Bristol Company
Chaplin-Fulton Mfg. Co.
Fort Worth Laboratories.
Gilfillan Machine Works, Inc.
Phillips Heating, Ventilating & Mfg. Co.
Reliance Mfg. Co.
Mueller Co.
Reynolds Gas Regulator Co.
Sprague Meter Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Regulators, Temperature
C. B. Babcock Co.
The Bristol Company
Fort Worth Laboratories
Jensen Instrument Co.
Leahy Mfg. Co.
Magic Way Company.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Regulators, Oven
C. B. Babcock Co.

Repairs—Brickwork
J. T. Thorpe & Son, Inc.

Retorts
The Bartlett Hayward Co.
United Engineers & Constructors, Inc.

Riveted Pipe
The Bartlett Hayward Co.

Rock Gas
Imperial Gas Co.

Roofing
The C. & G. Cooper Co.
Pioneer Paper Company.

Rotisserie
C. B. Babcock Co.
General Gas Light Co.

Rust Preventatives
Pioneer Paper Company.

Seals
Lattimer-Stevens Co.

Scrubbers
Baker Iron Works.
The Bartlett Hayward Co.
United Engineers & Constructors, Inc.
Western Pipe & Steel Co.

Settings, Boiler and Bench
J. T. Thorpe & Son, Inc.

Sheet Metal
Baker Iron Works.
Western Pipe & Steel Co.

Shingles
Pioneer Paper Company.

Sleeves
S. R. Dresser Mfg. Co.

Specials
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Stacks, Steel
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Stand Pipes
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Steel Plate Construction
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Steel Work, Structural
Baker Iron Works.
Western Pipe & Steel Co.

Stills
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Stoppers, Gas Main
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Stops, Brass
Lattimer-Stevens Co.
Mueller Co.

Stops, Iron Body
Lattimer-Stevens Co.
Mueller Co.

Strainer, Gas, Water, Air, and Oil
Mueller Co.

Systems
Payne Furnace & Supply Co.

Systems—Heating
American Radiator Co.
C. B. Babcock Co.
Magic Way Company.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.

Systems, Hot Water Heat Control
The Cleveland Heater Co.
Mueller Co.

Tachometers
The Bristol Company
Jensen Instrument Co.
Westcott & Greis, Inc.
The Foxboro Co., Inc.

Tanks
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Thermometers (Indicating and Recording, etc.)
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Thermostats, all kinds
American Radiator Co.
C. B. Babcock Co.
The Bristol Company
The Cleveland Heater Co.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
Robertshaw Thermostat Co.
Spencer Thermostat Co.

Tile, Refractory
Gladding, McBean & Co.
Stockton Fire Brick Co.

Tools
Mueller Co.
Safety Gas Main Stopper Co.

Traps, Steam
Jensen Instrument Co.

Trench Excators
C. B. Babcock Co.
The Cleveland Trencher Co.

Truck Tires
Motor Tires, Inc.

Tubing—Iron
Mueller Co.
South Chester Tube Company

Tubing—Steel
South Chester Tube Company

Unions
Leahy Mfg. Co.
Mueller Co.
Pittsburgh Equitable Meter Co

Valves, Back Pressure
C. B. Babcock Co.
The Bristol Company
Chaplin-Fulton Mfg. Co.
Jensen Instrument Co.
Reynolds Gas Regulator Co.
Westcott & Greis, Inc.

Valves, Electro-Magnetic
C. B. Babcock Co.
The Bristol Company
Magic Way Company.

Valves, Gas Engine
The C. & G. Cooper Co.

Valves, Gate
Baker Iron Works.
The Bartlett Hayward Co.

Valves, Needle for Gas Stoves
C. B. Babcock Co.

Valves, Relief
The Bartlett Hayward Co.
Chaplin-Fulton Mfg. Co.
Jensen Instrument Co.
Leahy Mfg. Co.
Mueller Co.
Reynolds Gas Regulator Co.
The P. H. & F. M. Roots Co.

Valves, Plug
Jensen Instrument Co.
Lattimer-Stevens Co.
Merco Nordstrom Valve Co.

Varnishes
Hill, Hubbell & Company.

Vulcanizers (Tube) Gas
Reliance Mfg. Co.

Washers
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Water Gas Equipment
The Bartlett Hayward Co.
Charles R. Collins.

Water Heaters
The Cleveland Heater Co.
Pacific Gas Radiator Co.
Rotary Manufacturing Co.
Superbo Mfg. Co.
Welsbach Company.

Yarn, Calking
Pioneer Paper Company.
Safety Gas Main Stopper Co.

DIRECTORY of the Industry

Gas

Generating Equipment
Wash Boxes
Scrubbers
Purifiers
Riveted or Welded
Boilers
Electric Elevators
Cranes and Hoists

BAKER IRON WORKS
Los Angeles
950 No. Broadway

THE FORT WORTH LABORATORIES
Instrument Department
Meriam Manometers *Tycos* Instruments
Laboratory Apparatus
828½ Monroe Street Fort Worth, Texas

WHY NOT PATENT AND PROTECT YOUR INVENTIONS?
They may prove valuable.
I have made a specialty of Patent Office practice for the past fifteen years and can assure you of expert service and prompt attention to patent and trade-mark matters.
LESTER L. SARGENT
Registered Patent Lawyer
1115 K Street, N. W. Washington, D. C.

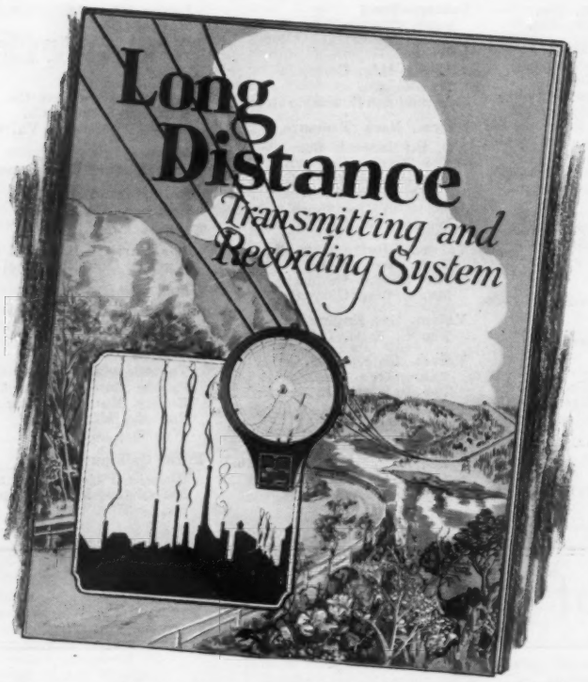
Byllesby Engineering and Management Corporation
231 S. La Salle Street
CHICAGO
New York Pittsburgh San Francisco

SMITH-EMERY CO.
Chemists—Engineers
Established 1910
Analyses and tests. Represent Pittsburgh Testing Laboratory for inspection at Eastern foundries, mills and shops.
Offices & Laboratories
920 Santee St. Los Angeles
651 Howard St. San Francisco

J. B. GILL CORPORATION
NATURAL GAS ENGINEERS
COMPRESSOR PLANT DESIGN AND CONSTRUCTION
P. O. BOX 669 LONG BEACH, CALIFORNIA

CHAS. R. COLLINS
Management, Operation, Examinations, Appraisals Relating to Manufactured Gas
4424 White Building
SEATTLE, WASHINGTON

JENSEN INSTRUMENT CO.
Pyrometers—Recorders—Controllers
Draft Gages—CO_2 Instruments—Steam Traps
Thermometers—Chemical Glassware
Orifice Meters—Manometers
624 East 4th Street Los Angeles, Calif.
950 Parker St., Sta. A. Berkeley, Calif.



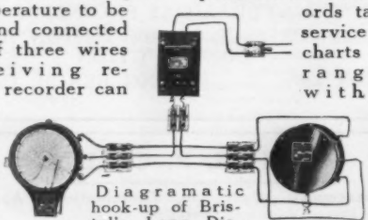
New Bristol's Catalog

Gives interesting story of how Long Distance centralizes operating information at the point of control.

THE full value of using Bristol's Long Distance Transmitting and Recording System is better realized when one considers the instant contact it gives with all parts of the plant or system. Very often it becomes vitally necessary to know what temperature or pressure is being maintained at some distant point, such as pipe lines; or at stills or coolers, etc., which may not be conveniently accessible by ordinary means.

In such instances a continual survey of existing conditions is provided by the Bristol's Long Distance System; the transmitting unit being installed at the source of pressure or temperature to be measured, and connected by means of three wires to a receiving recorder. This recorder can be mounted at any conveniently centralized point desired—at a distance of a few hundred feet away or even up to several miles—(successful installation has been made with transmitter and receiver eighteen miles apart). On the receiving instrument chart is recorded an exact duplication of conditions prevailing at the transmitter.

How Bristol's Long Distance equipment is being used to advantage in many industrial plants, utility systems, etc., is described fully in new catalog No. 1900, pictured above. Also included is complete listing of Indicating and Recording Instrument models which can be furnished—full size chart reproduction with actual records taken in field service — listing of charts in various ranges for use with Long Distance Systems — diagrams illustrating different methods of hook-up possible, etc.



Diagramatic hook-up of Bristol's Long Distance System for Pressure. Left: Indicating Transmitter; right: Recording Receiver.

A copy of Catalog No. 1900 will be mailed to any interested person in your plant. Send us name and address.

THE BRISTOL CO., Waterbury, Conn.

WATERBURY CONNECTICUT

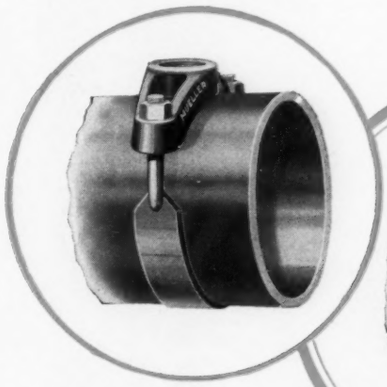
Branch Offices:

San Francisco Akron Denver St. Louis Chicago Detroit
Birmingham Pittsburgh Philadelphia New York Boston

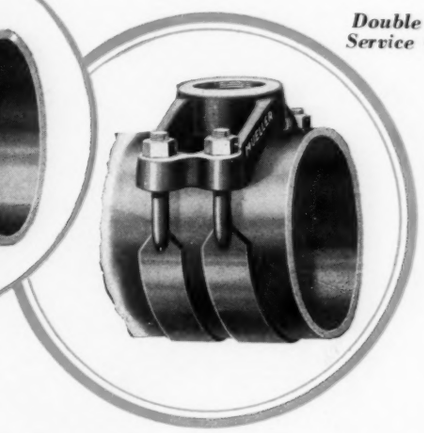
Advertisers' Index

Acme Gas Cleaner Co. 62
The Arco Company 64
C. B. Babcock Company 70
The Bartlett Hayward Co. 58
The Bristol Company 80
California Oxide Co. 62
The Chaplin-Fulton Mfg. Co. 60
Cleveland Heater Company 13
Cleveland Trencher Company 75
The C. & G. Cooper Co. 1
S. R. Dresser Manufacturing Company 9
Duro Gas Burner Company 60
Electrogas Furnace Co. 72
The Foxboro Company 2
L. H. Freymuth, Jr. 72
General Gas Light Co. 16
Gilfillan Machine Works, Inc. 74
Gladding, McBean & Co. 72
Hill, Hubbell & Co. 18
Hot-N-Kold Corporation 73
Imperial Gas Co. 75
Johnson Gas Appliance Co. 68
E. A. Key Co., Inc. 64
Lattimer Stevens Co. ..... *Fourth Cover*
Leahy Manufacturing Co. 61
McEverlast, Inc. 10
Magic Way Company 74
Merco Nordstrom Valve Co. ..... *Second Cover*
Lee B. Mettler Co. 71
Chas. C. Moore & Co., Engineers, Inc. 67
Motor Tires, Inc. 69
Mueller Co. ..... *Third Cover*
National Meter Company 70
Pacific Gas and Electric Company 15
Pacific Gas Radiator Company 14
Pacific Meter Works 5
Payne Furnace and Supply Co., Inc. 57
Phillips Heating, Ventilating & Mfg. Co. 68
Pioneer Equipment Corporation 73
Pittsburgh Equitable Meter Company 7
Plant Rubber & Asbestos Works 67
Reliance Manufacturing Company 71
Reynolds Gas Regulator Company 70
Robertshaw Thermostat Co. 63
Robinson Orifice Meter Co. 75
The P. H. & F. M. Roots Co. 8
Geo. D. Roper Corporation 65
Rotary Manufacturing Co. 69
Safety Gas Main Stopper Co. 77
A. O. Smith Corporation 4
South Chester Tube Co. 68
Sprague Meter Co. 77
Stauffer Chemical Company 66
Stockton Fire Brick Company 66
J. T. Thorpe & Son 73
United Engineers & Constructors, Inc. 11
U. S. Cast Iron Pipe and Foundry Co. 3
Wailes Dove-Hermiston Corp. 6
Welsbach Company 59
Westcott & Greis 12
Western Pipe & Steel Company 67

MUELLER SERVICE CLAMPS



Single Strap Service Clamp



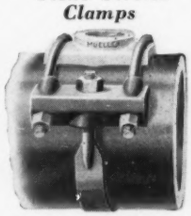
Double Strap Service Clamp

Good Work is possible

only with Dependable Fittings

How to insure a dependable connection in old pipe, weakened by corrosion, or in light-weight pipe—Mueller Service Clamps offer the easiest and most practical way.

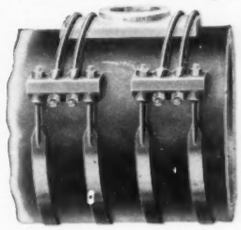
Flexo Service Clamps



Single Strap

The single and double strap patterns are made of malleable iron. The Flexo patterns are cast iron because there is no breaking strain in making them fast. A good joint is assured by the heavy boss on all Mueller Service Clamps which permits a full depth of thread. Patented Lead Ring Gaskets are used on all but the largest Flexo pattern to prevent leaks between pipe and clamps.

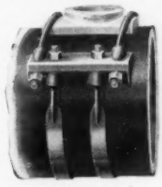
Four Strap Flexo Service Clamps



Write for complete descriptions and prices.

MUELLER CO. (Established 1857)

San Francisco: 1072-76 Howard St. 2468 Hunter St., Los Angeles.
Dallas: 901 McKinney Ave.
Factory: **Decatur, Illinois**
Canadian Factory: **MUELLER, Limited, Sarnia**



Double Strap

MUELLER

For a Long Time There Has Been a Demand For a Stopcock With a

Malleable Iron Body

At last you can buy it. A MALLEABLE IRON BODY and a Red Brass Key. The MALLEABLE IRON BODY combines the advantages of the brass body and the grey iron body. Manufactured to meet most exacting requirements.

Lattimer Stevens

METER CONNECTIONS-SHELVES
STOP COCKS ~ ~ ~ AND SEALS

LLFe31

Columbus, Ohio

New England Representative
The Eastern Service Company
250 Stuart St. Boston, Mass

Chicago Representative
The Utilities Service Co.
122 S. Michigan Ave.

San Francisco Representative
A. P. Bartley
163 Second St.